# INDEX.

*List of sub-headings* :—CABLE(S), CITY NOTES, CONTRACTS OPEN AND CLOSED, CORRESPONDENCE, ELECTRIC(AL), ELECTRICITY, ELECTRICITY WORKS, ELECTRIC LIGHT AND POWER NOTES, LEGAL, NEW COMPANIES, OBITUARY, OFFICIAL RETURNS, PARLIAMENTARY, PROSPECTUSES, RAILWAY(S), REVIEWS, SOCIETIES AND INSTITUTIONS, SUPPLY STATION ACCOUNTS ANALYSES, TELEGRAPH NOTES, TELEPHONE NOTES, TRACTION NOTES, TRAMWAY(S).


ABBOTT, W. L., on Operating economies in central station practice, 318
Accessories of electric traction, Indispensable, by H. E. P. Cottrell, 240, 297, 492
Accident, The Cheltenham, 874
" on the City and South London railway, 917
" Lift, 429
Accidents, Fatal, 435
" from overhead wires, 336
" Supply station, 796, 809, 815, 991
Acetylene gas head-lights for American locomotives, 147
Address, Inaugural, by Prof. Perry, 769, 803, 841
A.E.G. 3,000-KW. alternator at the Paris Exhibition, The, 45
Aldridge, J. G. W., on the Automobile for electric street traction, 479
Allingham, G. C., on Interior wiring, 494
Alternating current induction motors, by A. C. Eborall, 157, 201, 277
" current lamps, Progress in arc lighting by, by H. W. Hillman, 564
" currents, Copper saving in the joint transmission of direct and, by F. Bedell, 32
Alternator at the Paris Exhibition, The A.E.G. 3,000-KW., 45
" by Ganz & Co., Three-phase, 532
" Test of a 300-KW. steam, by N. Appelbee, 972
Alternators coupled in parallel, The synchronisation of, 543, 590, 764, 881
" on open circuit, The E.M.F. of, by C. C. Hawkins, 655, 691, 867
" Some notes on the design of large, by A. Heyland, 895, 931, 971
Aluminium, 1034
American amenities, 756
" brake tests, Some, 365
" commerce and manufacture, 980
" Electro-Therapeutic Association, The, 888
" engineers, Visit of, 24, 41, 269, 280
" impressions, 873
" invasion, 917
" practice in cable manufacture, A comparison of English and, by J. Wright, 732
" steam engine practice, Recent, 768
" tramway practice, 359
" tramway practice, Impressions of, by A. E. Le Rossignol, 118
" wiring practice, 650
Andrews, L., on Record breaking joint making, 591
Apparatus for the detection and registration of electrical vibrations, by A. C. Popoff, 815, 882
Appelbee, N., on Test of a 300-KW. steam alternator, 972
Appleyard, R., on Fault tests for cable core, 321
Appointments, 350, 474
" vacant, 24, 68, 107, 149, 191, 226, 269, 312, 350, 392, 435, 473, 515, 556, 594, 638, 675, 716, 755, 797, 837, 918, 954, 1034
Arbitration, 905
Arc, Continuous current, 694
" lamp, A new, 57
" lamp novelties, 821
" lamps on series circuits, Enclosed, 716
" lamps, on the Photometry of, by F. W. Carter, 44, 120, 197
" lighting by alternating current lamps, Progress in, by H. W. Hillman, 564
" On rapid variations in the current through the direct-current, by W. Duddell, 990, 1038
" The direct current, 970
Ardross Castle, Electricity at, 837
Argentina, Electrical enterprise in, 524
Aron electricity meters at the Paris Exhibition, 300
Assessment of an electric supply company for income tax, The, 1022
Atoms and electrons, Ions, 541
Automobile club trials of electrical vehicles, The, 816
" for electric street traction, The, by J. G. W. Aldridge, 479
" New form of electric, 892
" show in New York, An, 861
" shows, American, 873
" trip to Southsea, 837
" trials, Electric, 1017
Automobiles as source of revenue for central stations, by E. A. Sperry, 317
" Photographic methods of determining speed of, 952
Ayrton, Prof. W. E., and T. Mather, on Some developments in the use of Price's guard-wire in insulation tests, 320

BANKRUPTCY proceedings, 16, 56, 97, 176, 217, 258, 299, 338, 377, 420, 458, 545, 582, 621, 658, 676, 699, 780, 823, 867, 905
Barker, J. H., on A combination integrating wattmeter and maximum demand indicator, 418
Bathurst, F., on The electric generating system of Prague, 248, 407
Batteries for small stations, Storage, 289
Battery traction, 473
" " in Belgium, 990
" 2,000-volt storage, 741
Bedell, F., on Copper saving in the joint transmission of direct and alternating currents, 32
Behr, F. J., on the Manchester and Liverpool railway; brakes and signals, 482
Belleville boilers, 224, 675, 707
Blast furnace gas, 321
" " gas, Practical considerations involved in the generation of power by, 503, 579
Blast furnace gas-power installation, 949
Boiler, Belleville, 224
" coal-eating water-tube, 756
" Cummins water-tube, 540
" explosion, Sydenham, 268, 312, 392
" explosions and loss of life, 393
" explosions inquiry, 67
" -making, 581
" Niclausse water-tube, 765
" question, The naval, 285
" registration and inspection, 148, 458
" tubes, Corrosion of, 644
" Weir water-tube, 440
Boilers Committee, The Water-tube, 349
" in the Navy, Water-tube, 125, 282
Bois de Boulogne combined trolley and surface contact tramway, The, 250
Bolton Corporation electrical engineership, The, 312, 349
" vacancy, 226
Boosters, Direct current, by C. W. Hill, 35
Booth, W. H., on Load factors on traction stations, 362
Bradford Corporation tramway contracts, 214, 253
Bradshaw, W. F., on The first submarine cable, 46
Brake details, Car, 366
" tests, Some American, 365
Breach of contract, 176
Brine and electricity, 190
B.A., 1901, 474
" electrical papers, The, 325
British Association at Bradford, 269, 445, 541
" Association, A criticism of the, 466
" Association for the advancement of science, Bradford, 1900, 413, 479, 521, 561, 601, 643
" Association screw thread, 530, 561, 601, 643
" Insulated Wire Company's Works at Prescot, 343, 389
" v. American manufacturers, 797
Brook, E., on Electrically-driven shops, 132
Buenos Ayres, The electric lighting and tramways of, 61, 95, 239, 265
Building trades' gift to the nation, 2 6, 394, 796
Burgdorf-Thun polyphase electric railway, The, 576, 615, 695, 752
" railway, Prof. C. A. Carus-Wilson's paper on the, by E. K. Scott, 806
"Busyback," on Some interesting faults on telephone circuits, 127

CABLE(S)—
American Pacific, 914
Building, Increase in the use of gutta-percha in electric, by H. Hill, 536
Canadian-English, 838
Chifu-Tsin-Tau, 585
CABLE(S)—*continued*.
China, 714
Communication in the East, 380
Emden and New York, 513
Fault tests for cable core, by R. Appleyard, 321
First submarine cable, The, by W. F. Bradshaw, 46
German, 463
" to America, 179, 309, 380
Inductance of concentric, The, by W. H. Everett, 731
Interruption, 262
Junctions in the Royal Navy, 961
Manufacture, A comparison of English and American practice in, by J. Wright, 732
Manufacture, Some interesting faults met with in, by J. Wright, 605
Measurement of the resistance of, by A. C. Heap, 537
Mexican, 591
New Anglo-German, 870
" Atlantic, 21, 222, 362
" U.S. cable-ship *Burnside*, 591
Pacific, 100, 411, 714, 756, 795, 870, 916
" contracts, 179, 595, 618
Shanghai, 883
Specifications, 456
Stranding of the American steamship *Orizaba*, 636
Taku-Shanghai, 179
Telegraphy, Squier and Crehore on submarine, 288
West Indies, 946

Calcium carbide, 434
Caledonian Electric Power Company, 825
Canal haulage, Elec., 1010, 1094
" navigation, 406
Car equipments, Deficiencies in, by R. H. Tweedy, 290
" wheels slip, Why electric, by E. C. Parham, 652
Carhart, H. S., on The Imperial Physico-Technical Institution in Charlottenburg, 812, 854
Carter, F. W., On the photometry of arc lamps, 44, 120, 197
Carus-Wilson's paper on the Burgdorf-Thun Railway, Prof. C. A., by E. K. Scott, 806
Cathode rays for an electrode at zero potential, On the apparent emission of, by C. E. S. Phillips, 483
CENTRAL STATIONS (see Electricity Works.)
Charges for electrical energy, 1060
Charging electrical vehicles, 717
Charlottenburg, The Imperial Physico-Technical Institution in, by H. S. Carhart, 812
Chèvres (Geneva) electricity works, The, 586, 665, 708, 772, 912
Chlorine, Electrolytic production of soda and, 941
City and South London Railway, 381, 917

CITY NOTES—
Adams-Randall Telephone Patents Co., 957
Alderley and Wilmslow Electric Supply Co., 152
Allgemeine Elektricitäts Gesellschaft 919
Alliance Electrical Co., 314

CITY NOTES—*continued.*
Aluminium Co., 152, 193
Anglo-American Telegraph Co., 112, 153, 193, 558
Aron Electricity Meter Co., 837, 994
Baker Street and Waterloo Railway Co., 838
Bastian Meter Co., 27
Blackheath and Greenwich District Electric Light Co., 25
Blackpool and Fleetwood Tramroad Co., 273, 354
Brisbane Electric Supply Co., 759
Bristol Tramways and Carriage Co., 194, 760
British Columbia Electric Railway Co., 109, 152, 274, 680
" Continental Electricity Co., 70, 112
" Electric Traction Co., 558, 760, 798
" Electric Transformer Manufacturing Co., 152, 229
" Insulated Wire Co., 112, 232
" Thomson-Houston Co., 150
" Westinghouse Electric and Manufacturing Co., 876
Brompton and Kensington Electricity Supply Corporation, 194
Calcutta Electric Supply Corporation, 680
" Tramways Co., 71, 109
Callender's Cable and Construction Co., 640
Cape Electric Tramways Co., 72, 719, 798, 878
Castner-Kellner Alkali Co., 227, 274, 680
Central London Railway Co., 228
Charing Cross and Strand Electricity Supply Corporation, 194, 274
Chili Telephone Co., 230, 273
Chloride Electrical Storage Syndicate, 396
City and South London Railway Co., 111, 151, 192, 838
" of London Electric Lighting Co., 70, 72, 112, 154, 680, 958
Clontarf Hill and Howth Tramway Co., 395
Commercial Cable Co., 436, 958
Consolidated Telephone Construction and Manufacturing Co., 639, 678
Continental Co.'s, 996
County of London and Brush Provincial Electric Lighting Co., 154, 958
Crompton & Co , 72, 151, 191
Cuba Submarine Telegraph Co., 598, 639, 679
Dick, Kerr & Co., 598
Direct Spanish Telegraph Co., 476
" United States Cable Co., 71, 110, 151, 598
" West India Cable Co., 557, 838
Douglas, Southern Electric Tramways Co., 1035
Dublin and Lucan Electric Railway Co., 799, 957
" United Tramways Co., 230
Eastern Extension Telegraph Co., 72, 718, 758, 878
" Telegraph Co., 110, 152, 558, 958
Easton & Co., 996
Edison & Swan United Electric Light Co., 112, 152, 192
Edmundson's Electricity Corporation, 27, 71, 958
Electric and General Investment Co., 720
" Construction Co., 26, 110
" Power Storage Co., 27, 111
" Resistance and Heating, 995
" Street Car Syndicate, 679
" Timber Seasoning Co , 920
Electrical Power Distribution Co., 800
Elmore's German and Austro-Hungarian Metal Co., 27
" Trust, 382
Evered & Co., 518
General Electric Co. (1900), 640
German Electrical Companies, 353
Giffre Electro-Chemical and Power Co., 28
Globe Telegraph and Trust Co., 72, 153, 193, 518
Glover & Co., W. T., 436
Great Northern and City Railway Co., 229
Greenwood & Batley, 27
Halifax and Bermudas Cable Co., 557, 838
Henley's Telegraph Works Co., 194, 272, 354, 436
Hong Kong Electric Co., 230
Hornsby & Sons, R., 957
Hove Electric Lighting Co., 232
Imperial Tramways Co., 274
India-Rubber, Gutta-Percha and Telegraph Works Co., 919, 994
Indo-European Telegraph Co., 640
Ingleton Electric Lighting and Power Co., 996
Isle of Man Tramways Co., 72
Johnson-Lundell Electric Traction Co., 353
Kalgoorlie Electric Power and Lighting Company, 919, 957
Kidderminster and District Electric Light and Traction Co., 476, 760
Liverpool Overhead Railway Co., 154, 176, 331, 273
London Electric Omnibus Co , 1035
" United Tramways Co., 800
Marconi International Marine Communication Co., 230
Marconi's Wireless Telegraph Co., 395, 937, 994

CITY NOTES—*continued.*
Mersey Railway Co., 517
Monte Video Telephone Co., 679, 718
National Electric Supply Co., Preston, 230
" Telephone Co., 100, 111, 192, 996
Nernst Electric Light, 957, 993
Newcastle-upon-Tyne Electrical Supply Co., 557, 598
New General Traction Co., 639
" St. Helens and District Tramways Co., 597
" Zealand Electrical Syndicate, 760
North Staffordshire Tramways Co., 232
Notting Hill Electric Lighting Co., 112, 154, 193
Official Announcements *re* Companies, 71, 719
Oriental Telephone and Electric Co., 598
Parker, Thos., 26
Rand Central Electric Works, 72, 152, 192
Recording Telegraphs Co., 558
Reuter's Telegram Co., 598
Rockhampton Gas and Coke Co., 518
St. Helens Cable Co., 719, 920
St. James's and Pall Mall Electric Lighting Co., 112, 640
Siam Electric Railway Co., 598
Smithfield Markets Electric Supply Co., 232
Southern Electrical Installation and Wiring Co., 877
South Lancashire Electric Traction Co., 996
Stock Exchange Notices, 28, 71. 111, 231, 274, 314, 354, 396, 436, 518, 558, 598, 640, 680, 720, 760, 800, 837, 878, 920, 958, 1036
Submarine Cables Trust, 598, 680
Telegraph Construction and Maintenance Co., 72, 111
" Manufacturing Co., 436, 800
Type-Writing Telegraph Corporation, 597
United River Plate Telephone Co., 26, 112
Venezuela Telephone and Electrical Appliances Co., 919
Walker and Wallsend Union Gas Co., 799
Waterloo and City Railway, 229, 272
Waygood & Co., R., 719
West African Telegraph Co., 27
" India and Panama Telegraph Co., 720, 759, 799
Western Smoke Consumer and Fuel Economiser, 68
" Telegraph Co., 678, 718, 838, 878, 920
Westminster Electric Supply Corporation, 112, 232
White, J. G., & Co., 799
Willans & Robinson, 517
Windermere and District Electric Supply Co., 354
Wirral Railway Co., 354

Close season, The, 161
Closed conduit traction, 676
Coal, The World's, 690
" and ash conveyer for North-Western elevated plant, 377
" for electrical generating stations, 595
" question in England, The, 725
Cold store, Electrical equipment of a, 805
Combined lighting and power plant, The operation of a, by J. H. Perkins, 602, 643
" lighting and traction stations, 2, 67
" management of tramway and lighting departments, by R. C. Quin, 31
" tenders, 649
Companies' Act, 1900, The, 975, 1013
Commercial Information Bureau at Paris, 266
Compulsory supply of electricity, The, 765
Concentric cables, The inductance of, by W. H. Everett, 731
Condensing plant, Centralisation of, 686
Conduit *v.* Trolley, 245, 287, 350, 286
" tramway system, Development of the, 1043
Construction of large dynamos, The, 489
Consumer and "high voltage" supply, The, 165
Continental steam engine practice, 729
Continuous current arc, The, 694

CONTRACTS OPEN—
Aarhus (Denmark), 100
Aberdeen, 222, 263, 309, 464, 871
Accrington, 180
Aston Manor, 65
Asylum, 914
Ayr, 664, 871
Balearic Islands (Spain), 592
Barnes, 222
Battersea, 990
Belfast, 142, 592
Belgium, 65, 514, 915
Bermondsey, 514, 794
Bexhill, 833
Birkenhead, 464, 833, 914
Blackburn, 142
Blackpool, 833
Bootle, 514
Bradford, 142, 464, 592

CONTRACTS OPEN—*continued.*
Bray, 464
Brighton, 794, 915
Bristol, 744, 871
Buda-Pesth, 180
Bulgaria, 464
Buxton, 871
Cardiff, 65, 263, 554, 744
Copenhagen, 348, 833
Cuba, 514
Darlington, 65
Dartford, 554
Doncaster, 348
Dorking, 101
Dublin, 348
Dundalk, 380
Dundee, 554
Durham, 464
Eastbourne, 389
Edinburgh, 180, 990
Exhibition lighting, 990
Farnworth, 714, 990
France, 263, 592, 915
Fulham, 223, 433
Germany, 21, 65, 180, 263
Glasgow, 101, 389, 554, 636, 1033
Granton-on-Spey, 636
Great Western Railway, 554
Greenock, 309
Greenwich, 714
Grimsby, 101, 180, 223, 263, 464
Hackney, 263, 433
Halifax, 65, 142, 180, 714, 833
Hammersmith, 309
Hampstead, 309
Hanley, 263
Harrogate, 871
Hawick, 714
Hendon, 794
Hoylake and West Kirby, 464
Hull, 65, 309
Ilford, 263, 464, 664
India, 554
Islington, 21
Kendal, 714
Leeds, 180, 223, 871
Leigh, 871
Lincoln, 592
London, 142, 180, 348, 554, 592, 673, 744, 915
L.C.C., 223
Lowestoft, 21, 637
Luton, 180
Madrid, 21, 263
Maidstone, 514
Manchester, 21, 65, 263, 389, 464, 714, 833, 951
Mexborough, 348
Nelson, 310, 390
Newcastle-on-Tyne, 180, 310, 744
Newington (Southwark), 833
Newport (Mon.), 21, 223
North-Eastern railway, 871
Oldham, 794
Pacific cable, 101
Paraguay, 871
Partick, 833, 951, 990
Pemberton, 637
Perth, 348
Plumstead, 223
Poplar, 1033
Portsmouth, 188, 223, 349, 833
Preston, 310
Rathmines, 871
Rochdale, 21, 263
Rotherham, 1033
Roumania, 21, 263
Russia, 101
St. Pancras, 915
Salford, 65, 223, 349
Sheffield, 65, 433, 990
Shipley (Yorks), 263
Southampton, 310, 1033
Southend-on-Sea, 21
Spain, 138, 142, 223, 464
Stavanger, 554
Stockport, 65, 715, 744
Suffolk, 433
Sunderland, 65, 349, 514, 1033
Swansea, 514, 637, 915
Swindon, 871
Thetford, 990
Torquay, 101
Tyne, 833
Walker, 673
Walthamstow, 349
Warrington, 188, 514
Warsaw, 65
West Bromwich, 744
" Ham, 833
Whitby, 223
Whitechapel, 555
Whitehaven, 433
Wigan, 471
Wimbledon, 21
Worthing, 268, 951
Wrexham, 349

CONTRACTS CLOSED—
Aberdeen, 471, 715, 794
Accrington, 390
Ayr, 514, 951
Barnes, 349, 990
Barnsley, 673
Barrow-in-Furness, 592
Belfast, 871
Belgium, 147, 514
Bermondsey, 268, 238
Blackpool, 310, 390
Bootle, 223, 915
Bradford, 147, 268, 434, 990
Bridgwater, 147
Brighton, 951
Bristol, 514, 871
Brookwood Asylum, 268
Burton-on-Trent, 990
Cardiff, 310, 434, 471, 715, 754, 915, 951
Darwen, 951
Derby, 223

CONTRACTS CLOSED—*continued.*
Devonport, 872
Dublin, 833
Dundee, 673
Durban, 637, 834
Ealing, 188
Edinburgh, 147
Epsom, 188, 592
France, 65, 101, 390, 754
Germany, 514
Glasgow, 101, 147, 223, 268, 390, 514, 673, 753, 754, 871, 915
Grays, 555
Greenock, 514
Grimsby, 349
Hackney, 188, 673
Halifax, 592
Hastings, 871
Hereford, 951
Hertford, 637
Huddersfield, 268
Hull, 188, 223
Italy, 147, 1033
Keighley, 21
Kingston-upon-Thames, 223, 555
Liège, 794
Liverpool, 223
London, 21, 22, 65, 66, 101, 147, 188, 310, 434, 471, 637, 753, 754, 833, 834, 872, 1033
Louth, 637
Lowestoft, 990
Lynn, 101
Mersey, 390
Newcastle-on-Tyne, 471
Newington, 66
Newport, 592
Nuneaton, 434
Plumstead, 754
Plymouth, 101
Portsmouth, 66, 349, 471, 990
Redditch, 715
Rochdale, 223, 555
Roumania, 434
Salford, 390, 471
Sheffield, 754
Shoreditch, 147
Southampton, 471, 715, 1033
Southend-on-Sea, 471
Southport, 951
Stafford, 101
Stockport, 592
Suffolk, 673
Sunderland, 834
Sutton Coldfield, 268
Thorp Perrow (Yorkshire), 101
Torquay, 390
Tunbridge Wells, 471, 834
Tynemouth, 142
Wakefield, 66
Walsall, 268, 472
Walthamstow, 188
Warrington, 310
War Office, The, 592
Watford, 951
West Bromwich, 951
Witney, 514
Wolverhampton, 66, 592
Woolwich, 22, 833
" and Plumstead, 1033
Worksop, 592
Worthing, 555, 794

Contractors' Association, The proposed electrical, 984
Contracts for supply mains, 447
Cooling plant at Oldham, 486
Copper market, 16, 138, 218, 300, 472, 556
" saving in the joint transmission of direct and alternating currents, by F. Bedell, 32
Corporation energy for driving dynamos, 472

CORRESPONDENCE—
Aluminium jointing, by E. G. King, 818
" soldering, by J. Wright, 865
Annealing stampings, by "A.M.I.C.E." 539
Arc lamp litigation, by Jandus Arc Lamp and Electric Co., 256
Authorship made easy, by A. J. Lawson, 940
Bicycles and Icicles, by H. J. St. Benno Cunliffe, M.A., Oxon., 93, 175; by A. L. Stevenson, 133
Bradford Contracts, The, by Macartney, McElroy and Co., 257
" dust destructors, by J. McTaggart, 539
"Brighton" system, The, by "S. L. F.," 49
British Blahnik Arc Light Co., The by H. M. Chantrey, 256
Bury Electricity Supply Accounts, by S. J. Watson, 257
Cable testing (Transformers for), by A. F. Berry, 818
Central London Railway, by "H. C. L.," 15
Charging for electrical energy, by "A. W. D.," 940
City of London Co.'s charges, by "Contractor," 175
Combined tenders, by Ch. Leven, 777
Comparative cost of 100-volt and 200-volt supply, by "C. E.," 735; by H. Boot, 778, 817
Conduit *v.* Trolley, by "Conduit," 294; by "C. P. E.," 295; by A. M. Taylor, 337, 374; by "A Member of the Highways Committee," 373
Consulting engineers and their specifications, by "Philos," 430

CORRESPONDENCE—*continued.*
Continental steam engine practice, by J. Puller Phibbs, 777
Current specifications, by C. Turnbull, 215; by "An Observer," 294
Davy enclosed arc lamps, by W. J. Davy, 296
Destruction of underground cables, by Drake & Gorham, 93, 256; by A. A. Voysey, 132; by S. F. Walker, 133; by The Telegraph Manufacturing Co., 133
Destructor tests, by Meldrum Bros., 374
Doom of the contractor, The, by "Shutters Up," 480; by "Contractor," 457
Dynamo design, by "Constant Reader," 175; by "Undy," 216; by "Periodic Reader," 216
Electric bell problem, An, by "Subscriber," 15
" cranes, by C. B. Nixon, 215; by Wm. Smethurst, 256
" motor car problem, The, by A. J. Allen, 903
" railway motors, by G. T. Hanchett, 621
" railway standardisation, by E. H. Tyler, 903
Electrical cabs, by W. S. Naylor, 15
" engineering in the Navy, by "One who has served," 47; by "R. T. I. C." 175
" Engineers Volunteers, by A. E. Levin, 1023
" vehicle trials, by C. Opperman, 865; by T. G. Chambers, 939
Electricity meters, by C. O. Bastian, 133
" supply in small towns, by H. Boot, 776
Electro-Harmonic Society, by F. A. Glover, 620
" -mobile run, An, by the National Motor Carriage Syndicate, 215
" motors, by A. J. Harris, 49
Ethics of electrical engineering, by "Consultant," 903
Fetish worship, by "F. J.," 779
Gas *v.* Electricity, by "Inquirer," 539; by "W.," 578
German post office transmitter, The, by "F. G. B.," 940
Guard wires, by "The Writer of the Article," 420; by C. B. Nixon, 458
Hot bearings, by "Temperature," 458; by T. H. McMurray, 866
I. E. E. and Sunday observance, by "A Christian Briton," 134; by W. P. Adams, 174
Information wanted, by "N. E.," 940
" wanted, by "A Complete Novice," 983
" wanted, by "Sparks," 984
Interior wiring, by W. Fennell, 540, 620; by G. C. Allingham, 579, 657
Largest motor-generator plant, by Aktiengesellschaft, Brown, Boveri and Cie, 657; by Witting Bros., 697
Limitations of block signalling, by "C. M. J.," 579
London County Council and their tramways, by "Something in the City," 257
Long-distance telephony, by "The Author of the Paper," 174
Maintenance of electric motors, by G. Carew Knight, 15, 174; by C. B. Callow, 94
Manchester thunderstorm load curve, by "Spectator," 394
Meter systems, by P. E. White, 539
Molecular constitution of water, The, by "J. C. R.," 903, 940
Motor starters, by D. C. Bate, 175, 256; by C. B. Callow, 216; by Geipel & Lange, 256
Nalder Bros. & Co. (in liquidation), by Nalder Bros. & Thompson, 904
National Wiring Co. *v.* Jones, by National Electric Wiring Co., 774
Nature of the electric and magnetic quantities, On the, by R. A. Fessenden, 420
Nernst lamp, by J. E. Ritter, 620
New constant potential continuous current transformer, by F. W. Davies, 697
Once bitten, by "One of the Six," 818; by "Another of the Six," 866
110-volt *v.* 220-volt supply, by T. H. McMurray, 866, 983
Paris conference, The, by J. Raworth, 375
Pocket battery, by "D. B.," 94
Power for blast furnace gas, by I. M. de Havilland, 657
Precautions against electric shock, by W. E. Warrilow, 865; by "Distribution," 865; by H. W. Clothier, 865
Proposal to form an electrical contractors' association, by R. E. Dixon, 578; by R. B. Leach, 619; by G. N. C. Mann & Co., 619; by C. F. M'Innes, 619; by E. J. Dugdill & Co., 620; by "A Contractor," 735
Railway charges, by "Equity," 94
Record breaking joint making, by Cowans, Limited, 620; by E. F. Hammond, 656
Supply station accidents, by A. E. Porte, 939
Surface electric railway cars, by A. J. Allen, 940

CORRESPONDENCE—*continued.*
Telephone query, The, by F. C. Chapman, 940
Thompson's, Prof., lecture at Bradford, by Prof. S. P. Thompson, 501, 540, 579
Towns' refuse problem, by The Horsfall Destructor Co., 14; by "Incineratus," 14, 93; by "The Writer of the Article," 49
Tramway traction queries, by A. S. Giles, 133
Transformers for cable testing, by J. Wright, 777; by Cowans, Ltd., 736
Vibrations caused by motors, by Middleton Bros., 866
Water-tube boilers, by Babcock and Wilcox, 778
What's in a name? by "Elbe," 902
Wireless telephony at sea, by "Coast Communication," 539
Y. J. in G. B., by R. C. Quin, 373

Corrosion, Electrolytic, 206
" of boiler tubes, 644
Cottrell, H. E. P., on Indispensable accessories of electric traction, 240, 297, 492
Cowper-Coles, S., on Practical methods of overcoming the vibrations caused by motors, 811
Cranes, Electric, 167, 212, 216
" Electrical travelling, 367
Cravath, J. R., on Cutting structural iron by means of the electric arc, 747
Crehore and Squier on submarine cable telegraphy, 888
Crompton, Lieut-Col., R.E., on The Electrical Engineers (R.E.) in South Africa, 1020
Cummins water-tube boiler, 540

CURRENT SPECIFICATIONS—
Aberdeen, 585
Bootle, 605
Bristol Electric Crane, 814
Cardiff, 617
Grays-Thurrock electric lighting, 199
Hendon, 852
Horton Estate Asylum, L. C. C., 401
Kendal, 784
Kingston-upon-Hull extensions, 160
Leeds lighting extensions, 1043
Lowestoft, 726
Newcastle-on-Tyne, 774
Plumstead, 442
Portsmouth, 330
Salford electric tramways, 77, 108
Sheffield, 526
Southend-on-Sea and district light railways, 89
Stockport electric tramways, 283
Sunderland, 452
Swindon, 936
Torquay electric lighting, 209
Wakefield extension, 935
Worthing switchboard, 1006

Cutting structural iron by means of the electric arc, by J. R. Cravath, 747
Cylinder proportions for compound engines, 299

DANGEROUS electrical pressures, 654
Dangers of high tension supply, The, 691
Dawson, P., on Some general conditions governing power station design, 34
" W., on Recent tramway construction, with special reference to the Demerbe system, 521
Deaths from electric shock, 733
Deficiencies in car equipments, by R. H. Tweedy, 290
Demerbe system, Recent tramway construction with special reference to the, by W. Dawson, 521
Design and location of electric generating stations, The, by A. H. Gibbings, 522
" of large alternators, Some notes on the, by A. Heyland, 895, 931, 971
Destructor, at Torquay, Refuse, 238
" and electric power station at St. Helens, by J. S. Highfield, 7
" results, 389
Detection and registration of electrical vibrations, Apparatus for the, by A. C. Popoff, 845, 882
Determining experimentally the moments of inertia of the rotors of dynamos and alternators, On some methods of, by A. Hay, 287, 327
Diagrams, Power house, 115
Dictionary in three languages, A technical, 676
Dielectrics at high voltages, Notes on the testing of modern, by J. Wright, 653
" Non-inflammable, 312
Direct and alternating currents, Copper saving in the joint transmission of, by F. Bedell, 32
" -connected units, Standard, 368

Direct current and three-phase distribution for small installations, Relative advantages of, by H. A. Earle, 886
" current arc, On rapid variations in the current through the, by W. Duddell, 999, 1038
" current arc, The, 970
" current boosters, by C. W. Hill, 35
Disposal of house refuse, The, 405
" of house refuse in Bradford, The, by J. McTaggart, 415
" of towns' refuse, The, by Ed. C. de Segundo, 451
Dissolutions and liquidations, 16, 56, 97, 176, 259, 301, 338, 378, 420, 458, 545, 632, 658, 699, 740, 781, 867, 905, 986
Distribution for small installations, Relative advantages of direct current and three-phase, by H. A. Earle, 886
" of electricity, by G. Wilkinson, 31
Donkin revealer, The, 900
Double-current generators for electric railway service, 516
Dowsing electric radiator, 905
Doxford Hall, Northumberland, Electric lighting of, 4
Drilling and slotting of metals, Some notes on the electrolytic, by S. Cowper-Coles, 131
Driving: its possibilities and limitations, Electric, 603
Duddell, W., On rapid variations in the current through the direct current arc, 999, 1038
Dunlap, O. E., on Niagara Falls works, 358
Dust destructors, 107
" figures of electrostatic lines of force, by D. Robertson, 370
Dynamo makers in this country at the close of 1900, The position of, 1016
Dynamos, Construction of large, 489
" Corporation energy for driving, 472

EARLE, H. A., on Relative advantages of direct current and three-phase distribution for small installations, 886
Earth connections, On "earthing" and, 212
" returns, Electrolysis and, 1010
Earthing electric light mains, 529
Eborall, A. C., on Alternating current induction motors, 157, 201, 277
Economies in central station practice, Operating, by W. L. Abbott, 318
" in machine shop work, 902
Education of machinists, The, 115
Educational notes, 593
Elberfeld, Steam turbine at, 571

ELECTRIC(AL)—
Arc, Cutting structural iron by means of the, by J. R. Cravath, 747
Automobile, New form of, 392
" trials, 1017
Canal haulage, 1010, 1034
Carriages, 378
Coal cutting, 300
Contractors' Association, The proposed, 984
Cranes, 167, 212, 216, 300
Cure for tuberculosis, 269
Development in Japan, 797
" on a large scale for Melbourne, 810
" schemes in India, 705
Driving, 258
" its possibilities and limitations, 603
Energy by steam and gas engines, 637
" Charges for, 1009
Engineering at the Paris exhibition, 396
" in New Zealand, 43
" in North Wales, 23
Engineers as riflemen, 392
" in Paris, 850
" in South Africa, by Lieut.-Col. R. E. Crompton, 1020
" (R.E.) Volunteers, 168, 247, 255, 280, 571, 643, 671, 675, 716, 753, 792, 836, 873, 917, 950, 982
Enterprise in Staffordshire, 699
Equipment of a cold store, 805
" of a tall office building, The, 500
Exhibits at the Agricultural Hall, 301
Fan, 429
Feeders for main-line railroads, 687
Furnace, 593, 889
German engineering industry, 965, 1042
Haulage on canals, 833
Indian notes, 339
Installation at Bruges, 351
Locomotive, 635
" On the supersession of the steam by the, by W. Langdon, 923, 929, 961
Motor car problem, The, 855
" " trials, 785
Omnibuses in France, 869
Plant at the Sneyd Colliery, 749
" for Sydney, 208
Plants do not pay better, Why some municipal, 399
Power applications, 303
Cheap, 86

ELECTRIC(AL)—*continued.*
Power scheme for Western Highlands, 268
" Transition to, 953
" transmission in smelting works, 421
Pressures, Dangerous, 654
Progress in Germany, 339
Pump for sinking purposes, 218
Radiator, Dowsing, 905
Radiators, 659
Shock, Deaths from, 733
Smoke deposition, The possibilities of, by J. Wright, 811
Supply company for income tax, The assessment of an, 1022
" mains, 486
Theory of nervous and muscular action, An, 932
Traction, by R. Kennedy, 79
Transmission plants at Moodie's gold mines, Mr. Heather's paper on the, by E. K. Scott, 533
Travelling cranes, by C. W. Hill, 367
Undertakings, Opposition to, 87, 162
Vehicles, Charging, 717
" The Automobile Club trials of, 816
Vibrations, Apparatus for the detection and registration of, by A. C. Popoff, 845, 882
Volunteers, 68, 247, 255, 280
Waves along parallel wires, Propagation of, 516
" Molecular changes produced in matter by, 449
Work in Italy, 739

Electrically-driven hoists, Some recent tests on, 1023
" -driven shops, by E. Brook, 132
" -driven workshops, Relation of generator to motor capacity in, 126

ELECTRICITY—
Agriculture, in, 198
Application of, to tree felling, 435
Ardross Castle, at, 827
Compulsory supply of, The, 765
Distribution of, by G. Wilkinson, 31
Dover Harbour works, at the, 270
German Navy, in the, 311
Indian mines, for, 226
Mining, in, 339, 582, 593
Potato cultivation, and, 66
Power transmission by shafting *v.*, 501
Printing office, in the, 965
Shipbuilding yards, in, 258
Supply in small towns, 724
Works, Water loads for, by W. E. Warrilow, 1011

ELECTRICITY WORKS—
Alaskan, 347
Automobiles as a source of revenue for central stations, by E. A. Sperry, 279, 317
Bois de Boulogne Tramways, 250
Buenos Ayres, 61, 95, 239, 265
Chèvres, 586, 665, 708, 772, 912
City and South London Railway, 381
Farnworth Electric Tramways, 6
Fladbury, 974
Glasgow, 465, 470, 507, 546, 611, 638
Gloucester, 181, 200
Guernsey, 627
Leigh, 327
Liverpool, 625
Metropolitan Railway, Paris, 305
Norwich Electric Tramways, 143, 185
Paderno, 531
Practice, Operating economies in central station, by W. L. Abbott, 318
Rathmines, 427
Rochdale, 710
Southampton Corporation Electric Tramways, 103
St. Lawrence Power Co.'s plant at Massena, New York, 917
Stockport, 363
Sunderland, 303
Swansea tramways, 909
Sydney (N.S.W.), by A. C. F. Webb, 745, 790

ELECTRIC LIGHT NOTES—
Aberavon, 461, 506, 741
Aberdare, 868
Aberdeen, 58, 177, 302, 379, 429, 868, 943
Abertillery, 18, 302
Abersychon (Mon.), 138
Abram, 660
Accrington, 378, 782
Agriculture, 700
Albury, 259
Aldershot, 1030
Alfreton, 782
Alloa, 506
Alnwick, 430
Ambleside, 18
Annfield Plain, 506
Arbroath, 341, 551
Armidale (N.S.W.), 868
Ashford, 741
Ashton-in-Makerfield, 660
" -under-Lyne, 259, 868
Aspull, 987
Asylum, 177
Atherton, 701
Australia, 583
Austria, 177, 583, 624, 660, 741
Aylesbury, 1030
Ayr, 461, 506, 624

ELECTRIC LIGHT NOTES—*continued.*
Ballarat, 138
Ballymena, 302
Bangor, 259, 379, 824
Barking, 97
Barmouth 783
Barnes, 139, 341
Barnsley, 825, 868
Barnstaple, 605, 987
Barrow, 461
Barry (Glam.), 624, 660, 701, 906
Basingstoke, 138, 660
Bath, 58, 98, 379, 701
Batley, 58, 430, 741
Battersea, 18, 302, 553, 633
Bavaria, 219
Beaumaris, 18
Beckenham, 58, 868
Bedford, 461
Belfast, 138, 219, 341
Belgium, 624
Benfieldside, 506
Bermondsey, 58, 238, 552, 633, 742
Beverley, 259, 741
Bexhill, 58, 943
Bingley, 987
Birkenhead, 461, 583, 701
Birmingham, 18
Birstall, 18, 506
Blackburn, 219, 302, 906
Blackpool, 18, 768
Blackrock, 302, 551
Blairgowrie, 701, 825
Bloemfontein, 935
Board of Trade and provisional orders, The, 99
Bohemia, 302
Bolton, 551
Bombay, 883, 943
Boston, 701, 943
Bournemouth, 506, 660, 701, 1028
Bo'ness, 302, 506
Bradford, 58, 138, 302, 430, 461, 583
Bray, 701, 825
Brazil, 430
Brecon, 18, 259
Bridge of Allan, 260, 741
Bridgend, 18, 782
Bridgwater, 138, 943
Brighouse, 341, 552, 868
Brighton, 660, 782, 868, 943, 987
Brisbane, 302
Bristol, 177, 506, 583, 624, 660, 741, 825, 943
Brixton, 742
Broughty Ferry, 107
Buenos Aires, 302
Burgess Hill, 943
Burnley, 341, 906
Bury St. Edmunds, 58, 341, 943
Buxton, 18, 506
Calcutta, 98, 660
Camborne, 461
Cannock, 461
Canterbury, 624, 741, 782
Cardiff, 58, 461, 552, 701, 782, 936
Carlisle, 207, 461
Carmarthen, 219, 259, 511, 552
Carnarvon, 379
Carnoustie, 259, 379, 430
Castle Donington, 98
Chascomus (River Plate), 624
Chatham, 98, 107, 259
Chelmsford, 177, 219, 741
Cheltenham, 219, 430, 825
Chesham, 825, 987
Chester, 58, 341
Chichester, 188
Christchurch, 138, 379
Clayton, 944
Cleethorpes, 461
Cleveland, 825
Clewer, 18
Colchester, 58, 906, 944
Colliery plant, 461
Colombo, 944
Colwyn Bay, 660
Consett, 341, 624
Cork, 701
Coventry, 511, 584, 660, 1030
Cowes (I.O.W.), 188, 430, 906
Crayford, 906
Crewe, 219, 944
Criccieth, 701
Crieff, 307, 341, 461, 825
Crompton, 701
Crook, 624
Croydon, 18, 552, 660, 906
Crystal Palace, 177
Cults, 824, 825, 906
Cupar (Fife), 58, 98
Dalkeith, 58
Dalkey, 660
Darlaston, 741
Darlington, 987
Dartford, 660
Derbyshire and Nottinghamshire, 1030
Devonport, 18, 341, 379, 461
Dewsbury, 219, 259, 701, 741
Dolgelly, 783
Doncaster, 944
Dorking, 98, 701, 825, 906, 944
Dover, 701
Driffield, 18, 307
Dublin, 58, 98, 177, 259, 307, 341, 742, 987, 1030
Dudley, 430, 584, 742
Dukinfield, 783
Dumbarton, 259
Dundee, 341
Dungannon, 584
Dunmanway, 18
Dunstable, 98
East Cowes, 868
,, Ham, 379, 944
,, Molesey, 461, 701, 944
,, Stonehouse, 661
Eastbourne, 701
Eccles, 624, 661, 701, 906
Edinburgh, 906

ELECTRIC LIGHT NOTES—*continued.*
Elland, 219
Enfield, 461, 511
Epsom, 138, 583, 624
Exeter, 177
Fakenham, 259
Falkirk, 742
Farnworth, 307, 511
Faversham, 177, 341, 742, 907, 1030
Felling, 430
Festiniog, 868
Filey, 259
Finchley, 907
Fladbury, 974
Fleetwood, 552
Folkestone, 98
Foots Cray, 825
France, 907, 987
Freswick, 177
Friern Barnet, 139, 307, 701, 751
Frome, 661
Gainsborough, 661, 701
Germany, 139, 379, 511
Gillingham, 907
Glasgow, 58, 139, 259, 430, 584, 624, 638, 657, 1030
Glossop, 177
Gloucester, 18, 98, 200, 379, 701, 742
Goole, 342, 379, 868
Gorton, 783
Gosport, 430
Gourock, 1030
Grantown, 18
Gravesend, 177
Grays, 341, 624
Greenock, 341, 1030
Grimsby, 58
Guernsey, 177, 219
Gainsborough, 825
Gwyrfai (Carnarvonshire), 18
Hackney, 552, 584, 686
Halesowen, 219
Halifax, 341, 783, 944, 987
Hammersmith, 944
Hampstead, 139, 177, 430, 552
Hampton, 511, 783
,, Wick, 341, 783
Handsworth, 701
Hanley, 58, 177, 341, 511, 944
Hapton (Burnley), 260
Harrogate, 624
Harrow, 511
Harwich, 260
Hastings, 58, 342
Hayti, 379
Heaton Norris, 987
Hebburn, 624, 987
Heckmondwike, 584
Helensburgh, 907, 944
Hendon, 783
Hereford, 552, 584
Hertfordshire, 138
Hexham, 307, 511, 661
Heywood, 624, 907
Hindley, 783
Holland, 987
Holyhead, 461, 783
Honley, 260, 701
Hornsey, 18, 139, 633, 987
Horsham, 98, 461
Hore, 868
Hoylake, 342
Hull, 219, 342, 461, 552, 624
Hunstanton, 307, 944
Hyde, 462
Idle, 307
Ilford, 342
Ilfracombe, 58
Ince, 584, 624, 987
Ingleton, 58
Inverness, 58, 430, 624, 701, 825, 987
Islington, 58
Italy, 98, 177, 219
Keighley, 783, 987
Kelsall, 98
Kenilworth, 461, 544
Kensington, 907
Kettering, 944
Kiel, 219
Kilmarnock, 98
Kimberley, 987
King's Lynn, 18, 177, 219
Kingston, 584, 701, 944
Kingstown, 342
Kirkcaldy, 944
Knutsford, 307
Lambeth, 907
Lancashire, 379
Lancaster, 18, 98, 177, 307, 1031
Leamington, 18, 58, 98
Leatherhead, 139
Leeds, 430, 624, 661, 868, 907
Leicester, 552
Leigh, 307, 327, 430, 702, 742, 944
Lewes, 825
Lichfield, 868
Limerick, 98, 661, 783, 825, 1031
Lincoln, 260
Little Lever, 379
Littlehampton, 742
Liverpool, 379, 461, 624
Llandaff, 430
Llandilo, 783
Llandudno, 342, 1031
Llangollen, 825, 944
London, 18, 58, 98, 139, 177, 219, 260, 307, 342, 430, 462, 552, 584, 633, 661, 702, 742, 818, 825, 906, 944, 1031
,, Docks, 742
,, Electric Lighting Companies and the Board of Trade, 139
L.C.C., 38, 98, 139, 177
Long Eaton, 944, 1031
Longton, 461
Loughton, 307
Lowestoft, 461
Lytham, 987
Macclesfield, 552, 1031

ELECTRIC LIGHT NOTES—*continued.*
Madras, 944
Maidenhead, 219
Maidstone, 98, 139, 260, 307, 511, 584, 702, 868
Maldon, 944
Malton, 18, 661
Malvern, 219
Manchester, 19, 98, 219, 260, 511, 624, 717, 783, 825, 991, 1031
Mansfield, 139, 783
Marylebone, 139, 177, 825
Medomsley, 462
Melksham, 662
Melrose, 19
Mexborough, 825, 868
Middlesbrough, 260, 461, 944
Midland Electric Corporation, 702
Midsomer Norton, 987
Mines, Electric light in, 312
Mitcham, 742
Moffat, 584, 624, 987
Molesey, 624
Monmouth, 19, 139, 702
Montreal, 219
Morecambe, 624
Mountain Ash, 552, 702, 783
Neath, 462, 742, 944
Nelson, 430, 552
New Malden, 944
Newark, 379
,, (Notts.), 869
Newbury, 139, 342, 430, 825, 1031
Newcastle-Emlyn, 139
Newington, 58
Newport (Mon.), 19, 260, 584, 662, 825
Normanton, 783
Northampton, 1031
North London district, 178, 260, 552, 662, 702, 742, 783, 907
Northfleet, 511, 825
North Shields, 1031
Norton, 552
Norway, 178
Nottingham, 462, 869
Nottinghamshire and Derbyshire, 1030
Nuneaton, 98, 342, 430
Oban, 783
Oldham, 584
Omagh, 869
Ormesby, 825
Ottawa, 987
Otley, 742
Padstow, 19
Paignton, 742
Paisley, 634, 662, 702
Parliament and electric lighting competition, 23
Partick, 178, 633
Pateley Bridge, 633, 662
Pembroke, 59
Penang, 219, 462
Penistone, 98, 220, 260, 825
Penzance, 342, 633
Perth, 742
Peterborough, 430, 702, 869, 1031
Pickering, 783
Plumstead, 139
Plymouth, 59
Pocklington, 825, 944
Pokesdown, 1032
Pontefract, 430, 662
Pontypridd, 511, 783
Poplar, 178, 552, 570
,, Sick Asylum, 98
Portmadoc, 662
Portsmouth, 59, 261
Powers, 868, 905
Provisional orders, 59, 99, 139, 178, 220, 261, 555, 825
Pudsey, 988, 1031
Pwllheli, 140, 178
Quebec, 462
Radcliffe, 140
Radstock, 702
Rainhill, 462
Rangoon, 740
Rathmines, 260, 307, 427, 783
Redditch, 24, 1031
Rhondda Valley, 552, 702
Rhyl, 99, 307, 342, 988
Richmond, 178, 584
Rickmansworth, 702
Ripon, 379, 462, 633, 702, 1031
Risca (Mon.), 702
Rochdale, 178, 307, 633
Rochester, 19, 140, 633, 988
Rockhampton (Queensland), 1031
Rosario, 662
Ross, 944
Rotherham, 220
Rothesay, 907
Royton, 662, 784
Roumania, 379, 988
Roundhay, 783
Roundwood collieries, 260
Rowley Regis, 825
Russia, 220, 342
Ryde, 220, 260, 584, 633, 859, 907
Saddleworth, 220
St. Annes-on-Sea, 702
St. Austell, 1032
St. George's (Hanover Square), 633
St. Helens, 59, 220, 462, 702
St. James's Palace, 742
St. Margaret's, 702
St. Olave's Union (Southwark), 439
St. Pancras, 357, 907
Salford, 260
Saltburn, 430, 783
Sandown, 869
Santiago, 462
Scarborough, 261, 379
Selkirk, 826, 869
Sevenoaks, 511, 633
Shannon, 826
Sheffield, 261, 342, 379, 431, 511, 633, 783, 825
Shepton Mallet, 944
Shipley, 220, 511

ELECTRIC LIGHT NOTES—*continued.*
Shoreditch, 98, 307, 552
Shrewsbury, 784
Siam, 702, 1032
Sidcup, 552
Skipton, 826
Slaithwaite, 307, 462
Sleaford, 59, 99, 702
Smethwick 634, 826
South Shields, 99, 379, 826, 907, 941
,, Tyrol, 634
Southampton, 99, 702, 907, 988
Southend, 826
Southgate, 512
Southport, 19, 99, 512
Southwold, 988, 1032
Spain, 178, 431, 907, 1032
Stafford, 99, 742, 944
Staines, 552
Standish, 431, 462, 702, 826
Stirling, 307, 584, 869, 988
Stockport, 220, 263, 584
Stockton, 261, 634, 944, 988
Stourbridge, 140
Stourport, 59
Stratford (Birmingham), 634
Stratford-on-Avon, 708, 944
Strand, 634
Street, 700
Strokestown (Co. Roscommon), 703
Stromness, 703
Stroud, 220, 584, 662, 826, 944
Sudbury, 261, 634
Sunbury, 178, 907
Sunderland, 19, 261, 379, 634
Surbiton, 342
Swadlincote, 988
Swansea, 430, 907, 988
Swindon, 99, 584, 707, 784
Sydney, 703
Taunton, 307
Teddington, 784
Tewkesbury, 512
Theatre, 341
Thornhill, 784, 869
Thornley, 826
Tillicoultry, 462
Tiverton, 462
Todmorden, 743
Tonbridge, 944
Torquay, 662
Train, 218, 220, 430, 661
Transvaal, 869
Trowbridge, 59, 784
Truro, 462
Tunbridge Wells, 220, 826
Tyrol, The, 634, 988
Uxbridge, 140, 220
Wakefield, 59
Wales, 907
Walker, 59
Walmer, 743
Walsall, 59
Walton, 743, 869
Warrington, 379
Warwick, 584, 944, 988
Watford, 140
Wednesbury, 703
Wellington, 512, 742
Wells, 944
West Bromwich, 59, 99, 342, 552, 784, 944
,, Ham, 826, 1032
,, Hartlepool, 784, 907
,, Riding, 342
Western Valleys (Monmouthshire), 99
Weybridge, 584
Weymouth, 584
Whitby, 634
Whitechapel, 219
Whitehaven, 988
Whitley and Monkseaton, 784
Widnes, 944
Wigan, 634, 784
Willenhall, 307
Willesden, 59, 140, 907
Wimbledon, 307, 784
Windsor, 308, 663
Wirral, 19
Wisbech, 512, 662
Woking, 178, 703
Wolsingham, 140
Wolverhampton, 59, 178, 584, 703, 743
Worcester, 379, 662
Worksop, 140, 342, 462, 634, 662
Worsley, 945
Worthing, 59, 784, 826, 907
Wrexham, 512, 743
Yeadon, 308, 342, 430, 945
York, 308, 462, 552, 907
Yorkshire, 703, 826, 945

Electric Railway and Tramway Carriage works, Preston, Lancs., The, 209
Electro-chemistry, 430, 616, 773
Electrolysis and earth returns, 1010
Electrolytic corrosion, 206
,, drilling and slotting of metals, Some notes on the, by S. Cowper-Coles, 131
,, methods of quantitative analysis, 530
,, production of soda and chlorine, 941
Electro-medical apparatus, 339
Electrons, Ions, atoms and, 541
Electro-photographic experiments, Curious, 207
Electrostatic lines of force, Dust figures of, by D. Robertson, 370
E.M.F. of alternators on open circuit, The, by C. C. Hawkins, 655, 691, 857
Enclosed arc lamps in series circuits, 716

Enclosed electric motors, 779
Energy lost in resistances, Utilising the, 556
Engine records, Steam, 434
Engineering, The balance of trade in, 844
Engines, Cylinder proportions for compound, 299
" for central stations, Large, 201
" Some notes on inquiries for, by J. A. Seager, 159
" Stresses in steam, 992
English and American practice in cable manufacture. A comparison of, by J. Wright, 782
Ethics of insulating materials, The, by J. Wright, 454
Everett, W. H., on The inductance of concentric cables, 731
Exhibition, Electric tramways, 36
" of fire prevention, fire extinction, and fire escape apparatus at Berlin in 1901, The international, 953
Explosion at Chicago, 916
" at St. Helen's Alkali Works, The, 952
Explosions, 188, 148
" inquiry, Boiler, 67

FACTORY Act, Fined under the, 429
"Fair play's a jewel," 205
Fan blast, Improved, 740
Fans in the U.S. Navy, Electrically-driven, 796
Farnworth electric trams, 6
Fatalities, 472, 556, 675, 874, 954
" Electric shock, 815, 874
" on the Central London Railway, 594
Faults met with in cable manufacture, Some interesting, by J. Wright, 605
" on telephone circuits, Some interesting, by "Busyback," 127
" test for cable core, by R. Appleyard, 321
Feed pump efficiencies, 567
Fire prevention, 301
" Protection from, 22
Fires, 68, 180, 429, 474, 609, 952, 987, 991
Fleming's lectures, Dr., 835
Fly-wheel calculations, 603
Fly-wheels, The development of, 376
Forbes and Niagara, Prof., 797
Foreign trade competition, 835
Fuels, Gas engine, 499
Furnaces, Electric, 889

GADSBY, C. H., on Profits on tramway undertakings, 75
Ganz & Co., Three-phase alternator by, 532
Garland, C. H., on The Pollak-Virág telegraph, 628, 651
Gas, Blast furnace, 321
" engine fuels, 499
" engines for electrical purposes, 42
" " Utilising the waste heat of, 296
" power installation, Blast furnace, 949
Gauge report, Screw, 561, 601, 643
Gavey, J., on Telegraphs and telephones at the Paris Exhibition, 844
Generating sets in the German section of the Paris Exhibition, 88
" stations, The design and location of electric, by A. H. Gibbings, 522
" system of Prague, The electric, by F. Bathurst, 248, 407
Generation Power: comparative cost by the steam engine, water turbine, and gas engine, by J. B. C. Kershaw, 496, 563
" of power by blast furnace gas, Practical considerations involved in the, 503, 579, 977, 1015
German competition in Australia, 1035
" electrical engineering industry, The, 965, 1012
Germany, Large order for, 992
Gibbings, A. H., on The design and location of electric generating stations, 522
Glasgow Corporation, New electricity works of the, 465, 470, 507, 546, 611, 638
" Horse and electric traction at, 82
" Next year at, 954
Gloucester electricity works, 181, 200
Gloves for central station engineers, 917
Governing, Water-power, 514
Growth of polyphase systems, The, 689
Guard-wire in insulation tests, Some developments in the use of Price's, by Prof. W. E. Ayrton and T. Mather, 320
" wires, 332
" " Overhead construction, with special reference to, by S. Woodfield, 448
Guarini, E., and Lieut. Poncelet, on Wireless telegraphy with repeaters, 775
Guernsey electricity works, 627
Gun circuits, Naval, 973
Gutta-percha in electric cable building, Increase in the use of, by H. Hill, 536

HAWKINS, C. C., on The E.M.F. of alternators on open circuit, 655, 691, 857
Hay, A., on Some methods of determining experimentally the moments of inertia of the rotors of dynamos and alternators, 287, 327
Heap, A. C., on Measurement of the resistance of cables, 537
Heather's, Mr., paper on the electric transmission plants at Moodie's Gold Mines, by E. K. Scott, 533
Hering, C., on The Paris Exposition of 1900, 926, 966, 1003, 1040
Heyland, A., on Some notes on the design of large alternators, 895, 931, 971
High tension installations, Telephone instruments for, 835
" tension supply, The dangers of, 691
" voltage supply, The consumer and, 165
Higher pressure supply, 322
Highfield, J. S., on Destructor and electric power station at St. Helens, 7
Hillman, H. W., on Progress in arc lighting by alternating current lamps, 564
Hill, C. W., on Direct current boosters, 35
" " Electrical travelling cranes, 997
" " Motors, 198
" H., on Increase in the use of gutta-percha in electric cable building, 539
Hoists, Some recent tests on electrically-driven, 1023
Holly gravity return system, 17
Horsing electric tramways, 836
Hughes bequest, The, 190

IMPERIAL Physico-Technical Institution in Charlottenburg, The, by H. S Carhart, 812, 854
Inaugural Address, by Prof. Perry, 769, 803, 841
Incandescent electric lamps to the cost of electrical energy, On the relation of the price and efficiency of, 369
" lamp, The, by Ed. C. de Segundo, 119, 199
" lamps, 86
India, Electrical development schemes in, 705
Indicator, A combination integrating wattmeter and maximum demand, by J. H. Barker, 418
Indispensable accessories of electric traction, by H. E. P. Cottrell, 940, 997, 442
Inductance of concentric cables, The, by W. H. Everett, 731
Induction motor in the world, The largest, 494
" motors, Alternating current, by A. C. Eborall, 157, 201, 277
Inquiries for engines, Some notes on, by J. A. Seager, 159
Institution of Electrical Engineers, 157, 159, 201, 236, 277, 292, 803, 841, 863, 884, 886, 923, 929, 961, 977, 999, 1033, 1046
" of Electrical Engineers, Dinner to the, 902
Insulating materials, The ethics of, by J. Wright, 454
Insulation tests, Some developments in the use of Price's guard-wire in, by Prof. W. E. Ayrton and T. Mather, 320
Interception of despatches in wireless telegraphy, Arrangement intended to prevent the, by Dr. D. Tommasi, 46
Interior wiring, by G. C. Allingham, 494
Interruption of railway telegraph signalling apparatus through leakage, 594
Ions, atoms and electrons, 511
Iron and steel rails in America, 77
" Yorkshire, 357
Italian Southern Railway Co., Application of electric traction to the lines of the, 646

JOINT boxes, Electric light, 901
" making, Record breaking, by L. Andrews, 591

KALGOORLIE power scheme, 23
Kennedy, R., on Electric traction, 79
" R., on Long distance heavy electric railways, 1006
Kershaw, J. B. C., on Power generation: comparative cost by the steam engine, water turbine and gas engine, 496, 563

LABORATORY, The National Physical, 85
Langdon, W., On the supersession of the steam by the electric locomotive, 923, 929, 961
Larmor's, Dr. J., address to the mathematical and physical section of the B.A., 413
Lathes, Motor-driven, 491
Law of trade unions, The, 849
Lead-poisoning, Electrical treatment for, 312, 873
Leakage, Interruption of railway telegraph signalling through, 594
Lectures, 350, 674, 873, 891, 994, 1034
Leeds City Tramways, Tramway working costs on the, 843

LEGAL—
Attorney-General v. The National Telephone Co., The, 137, 780
Berry, Harrison & Co. v. Lockwood, 14
Blahnik Arc Light Co., The, 187
Brockie-Pell Arc Lamp Co. v. Johnson and Phillips, 148, 169, 191
Buchanan & Co. v. Bishop, 942
Burke v. British Blahnik Arc Light Syndicate, 216
Campion v. The Land and Water Electric Power, 582
Castner-Kellner Alkali Co. v. The Commercial Development Corporation, 170
Chamberlain & Hookham v. The Bradford Corporation, 820
Charing Cross and Strand Electricity Co. v. Johnson and Another, 270
Corporation of Hyde v. Oldham, Ashton and Hyde Electric Tramway Co., 49
" of the City of Dublin v. The Dublin United Tramways Co., 14
Coventry Gas Fittings, Electrical and Engineering Co., 698, 904
Crompton & Co. v. Albright, 820
Crow v. The Board of Works for the District of Whitechapel, 1021
Crystal Palace District Electric Supply Co., 136
Cunnington v. Fraser Bros., 904
Electrolytic Plating Apparatus Co. v. Evans & Son, 330
Frances, Mrs., Cameron, Heathville, Cults v. Messrs. P. C. Middleton and Co., 622
Hawkes v. The Leyton Urban District Council, 866
Islington Vestry v. The National Telephone Co., 217
Jandus Arc Lamp and Electrical Co. v. William James Davy, 171
Joseph v. Williamson & Joseph, 50
Killarney Electric Lighting Co., 904
Knight, J., v. The Brush Electrical Engineering Co., 505
Lang v. Lamplough.—Volenite, Ltd., 736
London Electrical Cab Co., 216, 608
Madras Electric Tramways Co. and Electric Construction Co. v. Cooper and others, 819
Mercier's Patents, Ltd. v. St. Helen's Cable Co., 176
" Patents, Ltd. v. the New Flint Colliery Co., 821
National Free Wiring Co. v. Jones, 736
" Telephone Co. v. Clontarf and Hill of Howth Tramway Co., 339
" Telephone Co. v. De Pass and Co., 554
" Telephone Co. v. Gulliver and Co., 820, 904
Notting Hill Electric Light Co., 660
Othen v. The Electrical Undertakings, Limited, 98
Pulvermacher v. Mott, 821
Recording Telegraphs, Limited, 697, 780, 821
River Plate Electric Light and Traction Co., 50, 698
Simon v. Conze, 137
Wolverhampton Corporation v. The British Electric Traction Co., 819, 904, 995
Legal query column, 77, 90, 237, 460, 557, 604, 646, 685, 767, 779, 847, 891, 960
Legality of a private telephone, The, 523
Leigh electric lighting works, 327
Le Rossignol, A. E., on the Impressions of American tramway practice, 118
Lessons of the Tramways Exhibition, 1
Lifeguard for electric trams, 556
Light cure, 836
Light Railway Commission, The work of the, by R. H. Scotter, 116
Liquid air and the company promoter, 574
Liquidations, dissolutions, &c., 16, 56, 97, 176, 259, 301, 338, 339, 341, 378, 458, 545, 582, 622, 658, 781, 823, 905, 943
Liverpool Corporation, Electric power stations of the, 625
Load curve, A thunderstorm, 349
" factors on traction stations, by W. H. Booth, 362
Locomotive, On the supersession of the steam by the electric locomotive, by W. Langdon, 923, 929, 961
London companies and the change in pressure from 100 to 200 volts, 1028
" County Council, 631, 659, 700, 762, 824, 862, 948
" County Council and electrical matters, 680
" electric lighting areas, The, 818
" New electric tramway schemes for, 168
Londonderry, Lord, and the telegraphists, 20
Long-distance electric transmission, 992
" heavy electric railways, by R. Kennedy, 1006
" telephony, 225
Losses in small lighting plants, 360
Ludw. Loewe & Co., Berlin, The works of, 668, 690, 709, 748, 851

MACHINE tools, 873
" shop work, Economies in, 902
Machinists' strike in America, The, 430
" The education of, 115
Main line railways, The electrical working of, by E. K. Scott, 897
Mains, Contracts for supply, 447
" Earthing electric light, 529
" Electric supply, 486
Maintenance of an electric tramway track, The, 24
Malleable iron for tramcar details, 453
Manchester and Liverpool Express Railway, by Sir W. H. Preece, 482
" and Liverpool Railways: brakes and signals, by F. J. Behr, 482
" Electricity Committee, 717
Marriages, 24, 68, 190, 225, 351, 394, 435, 515, 556, 836
Massena, N.Y., The St. Lawrence Power Co.'s plant at, 947
Mather, T., and Prof. W. E. Ayrton, on Some developments in the use of Price's guard-wire in insulation tests, 320
Maximum demand indicator. A combination integrating wattmeter and, by J. H. Barker, 418
McTaggart, J., on The disposal of house refuse in Bradford, 415
Measurement of the resistance of cables, by A. C. Heap, 537
Mechanical engineers, The training of, 569
" stoking in America, 715
Meeting of creditors, 17, 56
Melbourne, Electrical development on a large scale for, 810
Meter testing in the City, 595
Meters, 515
Metropolitan railway, The Paris, 305
" railway, The electrical equipment of the District and, 291, 836
Mine fields in the Royal Navy, Laying out, 936
Molecular changes produced in matter by electric waves, 449
Moments of inertia of the rotors of dynamos and alternators, On some methods of determining experimentally the, by A. Hay, 287, 327
Mono-railways, 190
Motor car emancipation Act, The, 770
" " problem, The electric, 855
" " trials, Electric, 785
" cars at manœuvres, 676
" driven lathes, 491
" generators, Large order for, 623
" in the World, The largest induction, 494
" vehicles for road service, Heavy 499
Motors, by C. W. Hill, 198
" Alternating current induction, by A. C. Eborall, 157, 201, 277
" Enclosed electric, 779
" Practical methods of overcoming the vibrations caused by, by S. Cowper-Coles, 811
Municipal Electrical Association, 1900 118, 716

Municipal electrical plants do not pay better, Why some, 399
" enterprise, The limitations of, 711
" profit making, 269
" telephones, 43, 664
" trading, 206, 505
Municipalities and electric tramways, 121
" and electrical undertakings, 397
Murray's long-distance high-speed page-printing telegraph, 393
Muscular action, An electric theory of nervous and, 932

NATIONAL Physical Laboratory, The, 85, 899, 954
" Telephone Co., The sorrows of the, 674
Naval notes, 715
Navy, Cable junctions in the Royal, 961
" Laying out mine fields in the Royal, 936
" Water-tube boilers in the, 125
Nernst lamp, The, 224, 575, 1018
Nervous and muscular action, An electric theory of, 932

NEW COMPANIES—
Aberdare Electric Lighting Co., 351
Accumulator industries, 474
Allen, W. H., & Sons, 25
Brisbane Electric Tramways Investment Co., 918
British and Foreign Electrical Vehicle Co., 757
" Electric Car Co., 270
" " Railways, 955
" " Street Tramways, 677
" " Tramways Investment Co., 918
" Galvanic Metal Packing Co., 271
" Motor Traction Co., 270
" Power, Traction and Lighting Co., 474
Brockie-Pell Arc Lamp, 102
Broom & Wade, 191
Cardwell, Boorman, Ford-Lloyd, 993
Columbia Motor Car Co., 757
Colwyn Bay Electric Light and Power Co., 676
Cowper-Coles & Co., Sherard, 435
C. V. Lamp Syndicate, 191
Crown Electric Heating Syndicate, 955
Cumberland Construction Co., 955
Dargue, Acetylene Gas Co., 24
Davis, J., & Son (Derby), 102
Doe Portable Electric Light and Power Syndicate, 68
Douglas, William, 874
Easton & Co., 993
Electric Incandescent Lamp Regenerating Syndicate, 436
" Lighting Boards (British Manufacturing Co.), 797
" Railways Co., 595
" Vehicle Co., of Great Britain, 757
Electrical Navigation Protection Co., 992
" Testing Laboratories, Ltd., 24
" Trades Supply, 757
Electro-Ceramic Syndicate, 474
Electro-Magnetic Traction Co., 68
Electromotion Corporation, 149
Finchley Electric Light Co., 351
Fleet and District Electricity Co., 993
Founders' Syndicate, 638, 798
Frankenburg & Co., Isidor, 918
French Electric Lighting Boards, 874
Fylde Painting, Plumbing, and Electrical Engineering Co., 394
Gardner Electric Drill and Hammer Co., 270
General Electric Co. (1900), 557
" " of Ireland, 874
Grosvenor Engineering Works, 191
Halifax Room and Power Syndicate, 270
Hamilton, Claud (Aberdeen), 874
Harwich Electric Lighting and Tramways Co., 191
Higginbottom & Mannock, 955
Hillgrove and Armidale Electrical Corporation, 955
Imperial Electric Supplies Co., 874
Improved Electric Glow Lamp Co., 68
Johnson Electro-Germicide Co., 312
Kettle River Power Co., 757
King Arc Lamp Co., 677
Lewisham and District Electric Supply Co., 25
London Electric Warehouse Co., 717
Lyndhurst Electric Lighting and Traction Co., 875
Medical Battery Co., 798
Metropolitan Motor Manufacturing Co., 270
Meyra Electric Co., 474
Middlesex and Hereford Electric Lighting and Power Co., 68
Mordey-Fricker Electricity Meter Co., 351
New Century Arc Light Co., 918
Northern Counties Electricity Supply Co., 955
" Counties Traction Co., 992
" Engineering Co., 270

NEW COMPANIES—*continued.*
Northwood Electric Light and Power Co., 149
Paterson, Cooper & Co., 955
Perfect Light Co., 874
Player, J., & Sons, 992
Premier Electric Lamp Co., 24
Priestman Bros., 271
Railway Construction and General Development Co. (Tasmania), 756
" Equipment and Construction Co., 992
Rawlings Bros., 875
Richardson, Westgarth & Co., 756
Rosling, Appleby & Fynn, 24
Ross Electric Light and Power Co., 875
Rowell, Stuart, Kelman & Co., 717
St. Austell and District Electric Lighting and Power Co., 24
Sandycroft Foundry Co., 68
Schattner Electricity Meter Co., 24
South Lancashire Electric Supply, 68
" " Electric Traction and Supply Co., 955
Sussmann Electric Miner's Lamp Co., 557
Taylor, Tunnicliff & Co. (1900), 102
Turner, Atherton & Co., 312
Typewriting Telegraph Corporation, 24
Union Cable Co., 351
Wakefield & Sons, J., 757
Walker & Hodgetts, 595
Waygood & Co., R., 25
Welsh Electric Traction Co., 992
White, J. G., & Co., 102, 301
Whittaker Bros., 875
Works Dismantling Co., 351
Yorkshire Electric Power Syndicate, 717

New York's latest traction system, 685
Niagara Falls works, by O. E. Dunlap, 358
" notes, 340, 954
Niclausse water-tube boiler, The, 765
Night lights in the Navy, 435
" signalling, 756
Non-inflammable dielectrics, 312
Norway, The rivers of, 836
Norwich electric tramways, 143, 185
Nuisance case, Cults, 986

OBITUARY—
Armstrong, G. F., 836
Butler, W., 593
Clarkson, C., 225
Cochery, A., 638
Davis, E., 795
Dent, M. C., 23
Hausmann, J., 795
Hudson, J. E., 593
Jefferies, J. R., 473
Mandèr, Alderman, 473
Reason, H., 23
Rew, David, 225
Short, E. C., 23
Vasquez, Senor Don Francisco de Paula, 66
Walker, Colonel P. B., 435, 473
Webster, J., 918

Observatories and electrical traction, Government, 716, 969

OFFICIAL RETURNS—
Bickle & Co., 595
British Aluminium Co., 352
" Continental Electr'city Co., 352
" Electric Transformer Manufacturing Co., 474
" Thomson-Houston Co., 352
Calcutta Electric Supply Corporation, 271
" Tramways Co., 352
Callender's Cable and Construction Co., 352
Chili Telephone Co., 474
Chloride Electrical Storage Syndicate, 757
Column Printing Telegraph Co., 474
Crompton & Co., 595
Cuba Submarine Telegraph Co., 191
Edison & Swan United Electric Light Co., 352
Edmundson's Electricity Corporation, 313
Electric Construction Co., 352
" and General Investment Co., 313
" Traction Co., 102
Electrical Power Storage Co., 351
Exchange Telegraph Co., 638
Globe Telegraph and Trust Co., 352
Greenwood & Batley, 352
Halifax and Bermudas Cable Co., 757
Johnson-Lundell Electric Traction Co., 757
Langdon-Davies Electric Motor Co. 677
Marconi International Marine Communications Co., 474
Mather & Platt, 875
Parker, Thos., 313
Reuter's Telegram Co., 102

OFFICIAL RETURNS—*continued.*
Sunbeam Lamp Co., 474
Telegraph Manufacturing Co., 271
Typewriting Telegraph Corporation, 875
United River Plate Telegraph Co., 271
West African Telegraph Co., 313
" India and Panama Telegraph Co., 102
White, Jacoby & Co., 638
Windermere and District Electricity Supply Co., 875
Wycombe (Borough) Electric Light and Power Co., 102

Open *v.* Enclosed arcs, 350
Opposition to electrical undertakings, 87, 162
Overhead construction with special reference to guard wires, by S. Woodfield, 448
" wires, Accidents from, 336
" wires, Spiders' webs and, 517
Owens College, The new laboratories at, 22

PACIFIC cable, 411, 618, 756, 795, 916
Paderno electric power station, The, 531
Pan-American Exposition, 555
" Exposition, Electric tower at the, 674
Papers, The B.A. electrical, 325
Parham, E. C., on Why electric car wheels slip, 652
Paris, The Electrical Engineers in, 292
" Exhibit of the Compagnie Internationale d'Electricité, of Liège, 392
" Exhibition, 6, 225
" Exhibition, The A.E.G. 3,000-KW. alternator at the, 45
" Exhibition, Aron electricity meters at the, 300
" Exhibition awards, 302, 340
" Exhibition, Electrical engineering at the, 796
" Exhibition (exhibit of J. J. Rieter & Co., Winterthur), 507
" Exhibition, Generating sets in the German section of the, 88
" Exhibition, High power single-cylinder engines at the, by E. K. Scott, 369
" Exhibition, The Sulzer exhibit at the, 410
" Exhibition, Telegraphs and Telephones at the, by J. Gavey, 884
" Exposition of 1900, by C. Hering, 926, 966, 1003, 1040
" International Electrical Congress, 441
" International Tramway Congress, 473
" Metropolitan railway, 305
" telegraph fêtes, The, 293, 361, 411
Parliament and electric lighting competition, 23

PARLIAMENTARY—
Baker Street and Waterloo Railway, 91
Batley Corporation tramways, 11, 216
Battersea electric lighting, 54
Blackpool, St. Anne's, and Lytham tramways, 93, 134
Bootle and St. Helens tramways, 11, 173
Bournemouth tramways, 173
Bradford tramways, 91
Brighton tramways, 12
Cambourne and Redruth tramways, 11
Charing Cross and Strand Electric Supply Corporation, 54
Electric lighting in East London, 54
" lighting in the Isle of Wight, 10
" Powers Bills, 10, 171
Garston tramways, 13
Glasgow District tramways, 92, 134
Gosforth electric lighting, 11
Halifax tramways, 91
Hastings tramways, 54
Herts Council and the Power Bills, 148
Huddersfield tramways, 134
Hull tramways, 12
Lancashire Bill, The, 172
Limehouse and Mile End, Electric lighting in, 134
Liverpool Corporation Bill, 11
" Overhead Railway, 93
London County Council Tramways, 136
" United Tramways, 91
Manchester Tramways, 173
Mersey Railway, 91
Metropolitan District Railway, 92
Morley Corporation Bill, 11, 173
Municipal trading, 12, 52, 92, 135, 176
Newcastle-on-Tyne electric supply, 136
North Metropolitan electric power supply Bill, 91, 216
Plymouth, Stonehouse, and Devonport tramways, 173
Preston Corporation Bill, 54
Private Bills, 17, 96
Rochdale tramways, 136
Rotherham tramways, 12

PARLIAMENTARY—*continued.*
St. Helens and Bootle tramways, 11, 173
Shannon water and power Bill, 50, 173
South-Eastern Metropolitan Tramways Bill, 54
" Lancashire tramways, 54
" Staffordshire tramways, 54
" Wales Bill, 7, 50, 172
Southampton tramways, 54
Southport tramways, 173
" and Lytham tramways, 173
Walsall tramways, 134
Warrington tramways, 13
Wellingborough tramways, 11
West Ham Corporation Bill, 11
Weston-super-Mare tramways, 12, 173

Patent agents, Unregistered, 795
" office, Report of the departmental committee on the, 79
" What is a user of a, 850
Perkins, J. H., on The operation of a combined lighting and power plant, 602, 643
Perry's admonition, Prof., 980
Personal, 23, 66, 102, 148, 226, 232, 310, 351, 393, 434, 472, 515, 556, 594, 638, 675, 716, 755, 796, 868, 873, 906, 917, 943, 954, 991
Phillips, C. E. S., On the apparent emission of cathode rays from an electrode at zero potential, 483
Photometry of arc lamps, The, by F. W. Carter, 44, 120, 197
Physical Society, 724, 846, 927
Piecework, 900
Plant, The usage factor of, 655
Pollak-Virág telegraph, The, by C. H. Garland, 32-, 651
Polyphase electric railway, The Burgdorf-Thun, 576, 615, 695, 752
" motor-generators, Large order for, 623
" systems, The growth of, 689
Poncelet, Lieut., and E. Guarini, on Wireless telegraphy with repeaters, 775
Popoff, A. C., on Apparatus for the detection and registration of electrical vibrations, 845, 882
Postal telegraphists and the Liberal party, 222
Postmaster-General's annual report, 473
Poulsen telegraphone, The, 573
Power by blast furnace gas, Practical considerations involved in the generation of, 503, 579, 977, 1015
" Cheap electric, 86
" Co., Caledonian Electric, 825
" generation: comparative cost by the steam engine, the water turbine and gas engine, by J. B. C. Kershaw, 493, 563
" house diagrams, 115
" scheme, Kalgoorlie, 23
" station design, Some general conditions governing, by P. Dawson, 34
" Transition to electric, 953
" transmission by shafting *v.* electricity, 501
" transmission in smelting works, Electrical, 421
POWER STATIONS (see Electricity Works)
Prague, The electric generating system of, by F. Bathurst, 248, 407
Preece, Sir W. H., on The Manchester and Liverpool Express railway, 482
" Sir W. H., on Wireless telegraphy, 484
Preparatory wiring, 326
Presentations, 23, 66, 226, 836
Pressure from 100 to 200 volts, London Companies and the change in, 1028
Price's guard-wire in insulation tests, Some developments in the use of, by Prof. W. E. Ayrton and T. Mather, 320
Printing office, Electricity in the, 964
Private Bills, 56
" telephone, The legality of a, 523
Production of high temperatures, The, 723
Profits on tramway undertakings, by C. H. Gadsby, 75
Propagation of electric waves along parallel wires, 516

PROSPECTUSES—
Baker Street and Waterloo Railway Co., 800
Bastian Meter Co., 1036
Blackheath and Greenwich District Electric Lighting Co., 153
Brisbane Electric Tramways Investment Co., 878
British and Foreign Electrical Vehicle Co., 995
" Electric Street Tramways, 877
Castner Electrolytic Alkali Co., 112
City of London Electric Lighting Co., 639
Diesel Engine Co., 958
Dudley, Stourbridge and District Electric Traction Co., 153
Edmundson's Electricity Corporation, 920
Electric and General Investment Co., 680
Electrical Power Distribution Co., 759
General Electric Co. (1900), 597
London United Tramways Co., 760
Richardsons, Westgarth & Co., 759
Rosling, Appleby & Fynn, 28

PROSPECTUSES—*continued.*
South Lancashire Electric Traction and Power Co., 919
United River Plate Telephone Co., 72
Waygood & Co., R., 28

Protection of electrical supply companies, The statutory, 521
ublic danger, A, 685

QUIN, R. C., on Combined management of tramway and lighting departments, 31

RADIO-ACTIVITY, 688
Rails in America, Iron and steel, 77
Railway rates and charges for electrical machinery and apparatus, 81

RAILWAY(S)—
America, in, 224
Burgdorf-Thun, 576, 615, 695, 752
" Thun Railway, Prof. C. A. Carus-Wilson's paper on the, by E. K. Scott, 806
Canada, in, 221
Central London, 148, 189, 269, 308, 512, 553, 832
Charing Cross and Hampstead, 635
City and South London, 369, 917, 1032
Double-current generators for electric service, 516
Electric traction on, 945
" traction under steam railway conditions, 281
Electrical equipment of the District and Metropolitan, 291
" working of main line, The, by E. K. Scott, 897
Electricity on steam, 1005
Jungfrau, The, 347, 394
Light, 102
Liverpool Overhead, 190
London, and property owners, 989
" Electric in, 435, 512
Long-distance heavy electric, by R. Kennedy, 1006
Manchester and Liverpool; brakes and signals, by F. J. Behr, 482
" and Liverpool Express, by Sir W. H. Preece, 482
" -Liverpool, 704, 945, 1032
Metropolitan, 149, 189, 836, 917
" (Paris), 305
Mono-, 190
New York Elevated, 989
Rome-Naples, 908
Signalling, 1002
Standards, 893
Third rail, A, 1012
Underground, schemes, 913
Victoria-Putney, 832

Rathmines electricity works, 427
Record breaking joint making, by L. Andrews, 591
Reduction of capital, 846
Refuse destructor at Torquay, 238
" in Bradford, The disposal of house, by J. McTaggart, 415
" problem, The town's, 24
" The disposal of house, 405
" The disposal of towns', by Ed. C. de Segundo, 451
Resistance, Note on an improved standard, by R. S. Whipple, 523
" of cables, Measurement of the, by A. C. Heap, 537
" of road vehicles to traction, 530
Resistances, Utilising the energy lost in, 556
Responsibilities of town councillors, The, 737
Reversibility of voltaic cells, 189

REVIEWS—
Chemistry of materials of engineering, The, by A. H. Sexton, 935
Cyanide process of gold extraction, The, by James Park, 95
Electric lamps and electric lighting, by J. A. Fleming, 511
" ship lighting, by J. W. Urquhart, 55
" tramway traction, by A. D. Greatorex, 95
" tramways, 1900, 934
" wiring tables, by W. P. Maycock, 934
Elementary principles of electric lighting, by A. A. C. Swinton, 94
Fowler's Mechanical Engineer's Pocket-Book for 1901, by W. H. Fowler, 1046
Gas lighting, by C. Hunt, 510

REVIEWS—*continued.*
Injectors, Their theory, construction and working, by W. W. T. Pullen, 898
Inventor's adviser, or Every man's own patent agent, The, by R. Haddon, 510
Laboratory Notebook for chemical students, by V. B. Lewes and J. S. S. Brame, 511
Law and practice relating to letters patent for inventions, by R. W. Wallace, 390
Lead storage battery, The, by Desmond G. FitzGerald, 1044
Les Décharges Electriques dans les gaz, by L. Barbillion, 898
Management of dynamos, The, by G. W. Lummis-Patterson, 1005
Manual of Electrical Undertakings 1900-1901, 1046
Mechanical traction in war for road transport, by Lieut.-Col. O. Layriz, 441
" World Pocket Diary and Year Book for 1901, 1045
Medical Electricity, by H. Lewis Jones, 1004
Modern electric railway motors, by G. T. Hanchett, 441
Motor vehicles and motors, by W. W. Beaumont, 899, 935
Practical Electrician's Pocket Book and Diary for 1901, 1046
"Practical Engineer" Electrical Pocket-Book 1901, 1046
" Engineer" Pocket-Book, 1046
Traité de magnétisme terrestre, by E. Mascart, 898
Up-to-date domestic and industrial applications of electricity, by "Alpha," 94

Rhodes, W. G., on A new method of starting three-phase induction motors, 372
Road vehicles to traction, Resistance of, 530
Robertson, D., on Dust figures of electrostatic lines of force, 370
Rochdale electricity works, 710
Röntgen rays, 675
" rays, The use of, 835
Rotors of dynamos and alternators, On some methods of determining experimentally the moments of inertia of the, by A. Hay, 297, 327
Royal assent, 294
Rubber in Rhodesia, 583
Rules, Wiring, 375

ST. HELENS, Destructor and electric Power station at, by J. S. Highfield, 7
St. Lawrence Power Company's plant at Massena, New York, The, 947
St. Pancras electric light mains, 357
Scott, E. K., on High power single-cylinder engines at the Paris Exhibition, 369
" E. K., on Mr. Heather's paper on the electric transmission plants at Moodie's Gold Mines, 533
" E K., on Prof. C. A. Carus-Wilson's paper on the Burgdorf-Thun Railway, 806
" E. K., on The electrical working of main line railways, 897
Scotter, R. H., on the Work of the Light Railways Commission, 116
Screw gauge report, 561, 601, 643
Seager, J. A., on Some notes on inquiries for engines, 159
Search light baton, A, 930
Segundo, Ed. C. de, on The disposal of towns' refuse, 451
" Ed. C. de, on The incandescent lamp, 119, 129
Shaft fractures, 506
Shafting *v.* electricity, Power transmission by, 501
Shannon electric power scheme, 206
Shock fatalities, Electric, 815, 874
Signalling, Electric railway, 1002
Slaby-Arco system of wireless telegraphy, The, 335
Slander case, An electrical engineer's, 873
Slotting of metals, Some notes on the electrolytic drilling and, by S. Cowper-Coles, 131
Small towns, Electricity supply in, 724
Smelting works, Electrical power transmission in, 421
Smoke abatement, 730
" deposition, The possibilities of electrical, by J. Wright, 811
" nuisance, 57, 218, 302, 943
" prosecution, 906, 992
Sneyd Colliery, Electrical plant at the, 749

SOCIETIES AND INSTITUTIONS—
American Electro-Therapeutic Association, 311, 883
" Institute of Electrical Engineers, Visit of, 224
" Society of Mechanical Engineers, 952

SOCIETIES AND INSTITUTIONS—*continued.*
American Street Railway Association, 515
British Institution of Draughtsmen, 435
Electrical Standardising, Testing and Training Institution, 149
Faradian Club, The, 730
German Electro-Chemical Society, 149
Institution of Civil Engineers, 755, 836
" of Electrical Engineers, 108 157, 200, 236, 277, 292, 796, 803, 836, 841, 863, 884, 886, 916, 923, 929, 961, 977, 991, 999, 1038, 1046
" of Electrical Engineers (Glasgow Local Section), 730
" of Electrical Engineers' meeting in Paris, 190
" of Electrical Engineers (Students' Section), 108, 159, 294
" of Junior Engineers, 16, 191, 637, 740, 836
International Association of Municipal Electricians of America, 435
Liverpool Engineering Society, 189
Municipal Electrical Association, 1900, 31, 118, 235
National Lecture, 191
Physical, 235, 734, 846, 926, 985
Röntgen, The, 67
" Society of the United States, 224, 916, 963
Royal, 755
" Institution, 755, 991
Society of Arts, 797

Soda and chlorine, Electrolytic production of, 941
South Africa, The Electrical Engineers (R.E.) in, by Lieut-Col. R. E. Crompton, 1020
Southampton Corporation Electric Tramways, 103
South-Western Polytechnic, Chelsea, 350
Speed of automobiles, Photographic method of determining, 952
Sperry, A. E., on Automobiles as a source of revenue for central stations, 279, 317
Squier & Crehore on Submarine telegraphy, 288
Standards, Electric railway, 893
Starting switches, 459
" three-phase induction motors, A new method of, by W. G. Rhodes, 372
Steam by the electric locomotive, On the supersession of the, by W. Langdon, 923, 929, 961
" engine practice, Continental, 729
" engine practice, Recent American, 763
" traps, 269
Steel industry, The state of the, 797
" its properties and tests, 400, 440, 496, 566, 645
Stockport electricity works, 263
Stoker, Essentials of a good, 674
Stoking in America, 715
Street traction, The automobile for electric, by J. G. W. Aldridge, 479
Stresses in steam engines, 992
Strike in America, The machinists', 439
Submarine cable telegraphy, Squier and Crehore on, 288
Sulzer exhibit at the Paris Exhibition, The, 410
Summons, 1030
Sunderland electric tramways, 303
Superheated steam in the steam turbine, Economies of, 351, 454
Supersession of the steam by the electric locomotive, On the, by W. Langdon, 923, 929, 961
Supply companies, The statutory protection of electrical, 321
" 110 *v.* 220-volt, 797
" station accidents, 796, 809, 815, 991

SUPPLY STATION ACCOUNTS—
Aberdeen, 475
Ayr, 677
Blackpool, 875
Bolton, 837
Bristol, 271
Burnley, 596
Burton-on-Trent, 352
Bury, 226
Canterbury, 108
Cardiff, 956
Chester, 25
Cork, 1035
Coventry, 517
Croydon, 69
Dewsbury, 313
Edinburgh, 638
Halifax, 271
Hammersmith, 69
Hampstead, 394
Harrogate, 857
Kingston-on-Thames, 313
Leeds, 757
Leicester, 677
Leyton, 955
Liverpool, 475
Manchester, 353
Nottingham, 149
St. Pancras, 108
South Shields, 395
Southport, 717
Stafford, 150
Stockport, 595

SUPPLY STATION ACCOUNTS—*continued.*
Tunbridge Wells, 918
Wolverhampton, 227
Yarmouth, 758

Surface contact tramway, The Bois de Boulogne combined trolley and, 250
Swansea electric tramways, 909
Switches, Starting, 459
Sydenham boiler explosion, 268, 312, 392
Sydney (N.S.W.), Electric tramways in, by A. C. F. Webb, 745, 790
Synchronisation of alternators coupled in parallel, 543, 580, 764, 881
Systems of current distribution on tramways, 723, 890

TALL office building, The electrical equipment of the, 500
Technical education, 525
Telautograph, The, 771
Telegrams to East Africa, 914
" to the East, 744

TELEGRAPH(S)—
African, 309, 870
Ashanti, 432
Australian, 1032
Brazilian, 513
Cables in the Far East, 21
Chinese, 100, 309, 347, 380
Communication between Liverpool and the Continent, 939
" with Siberia, 464
" with the East Indies, 348
Government and Eastern, 553
Imperial telegraphic communication 20, 141, 432
Indian, 464
" tariff, 100
Line with the Yukon, 262
Murray's long-distance high-speed page-printing, 393
Paris fêtes, The, 293, 361, 411
Pollak-Virag, The, by C. H. Garland, 628, 651
Post Office, 348
Rates to India, 793
Siberian, 100
Signalling apparatus through leakage, Interruption of railway, 594
South African, 348
Submarine in South America, 591
Telephones and, at the Paris Exhibition, by J. Gavey, 884
Trans-African, 180
Uganda railway, 309
Underground wires, 433
Wire export trade, 60, 262, 432, 585, 793, 946

Telegraphists at the Trade Union Congress, 432
" Lord Londonderry and the, 20, 309
Telegraphone, The Poulsen, 573
Telegraphy and lighthouses, Wireless, 100
" "Free Trade" and, 664
" in 1876, Wireless, 592
" in the Mediterranean, Wireless, 530
" in the recent naval manœuvres, Wireless, 406
" The Jubilee (?) of submarine, 350
" The Slaby-Arco system of wireless, 335, 1034
" Wireless, 23, 60, 142, 180, 309, 348, 513, 516, 570, 714, 744, 794, 871, 914, 917, 946
" with repeaters, Wireless, by E. Guarini and Lieut. Poncelet, 775

TELEPHONE(S)—
Aberdeen, 100, 141
Australian, 513
Belfast, 585
Berlin, 432
" -Paris, 222
Brighton, 100, 793
Cablegrams by telephony, 309
Cardiff, 179, 664
Carrier pigeons and, 380
Circuits, Some interesting faults on, by "Busyback," 127
Delays, 142
Dover, 100, 179
Dublin, 714
Egyptian, 833
Glasgow, 222, 347, 553, 591, 636, 946
" and The National Telephone Co., 263
Grantham, 60, 432
Grimsby, 914
Hartlepool, 793
Huddersfield, 142, 263
Kingston, 179
Legality of a private telephone, 533
London, 179, 636, 946
" to Brussels, 554
Manchester, 21, 100, 263, 347, 636, 914 1033
Mandalay, 914
Melbourne and Sydney, 714

TELEPHONE(S)—*continued.*
Municipal, 43
Newport, 946
Norwich, 60
Paris—Berlin, 222
Portsmouth, 60, 142, 263, 309, 432, 464, 591, 636, 714, 989
Proposed, between Sydney and Melbourne, 464
Rome—Paris, 664
Service, 21
Stations for high tension installations, 835
Sunderland, 100
Sydney, 142
Telegraphs and, at the Paris Exhibition, by J. Gavey, 884
Transmitter, New German Post Office, 914
Tunbridge Wells, 433
West Hartlepool, 714
Wires in Germany, 744

Telephonograph, The, 582
Telephony, Long-distance, 225
" Municipal, 664
" Wireless, by Sir W. H. Preece, 484
Temperatures, The production of high, 728
Temperley fuel transporter, The, 937
Tenders, Combined, 649
" Modification of, 225
Tesla's latest marvel, 334
Testing of modern dielectrics at high voltages, Notes on the, by J. Wright, 653
Test of a 300-KW. steam alternator, by N. Appelbee, 972
Tests of electrical vehicles, 595
" on electrically-driven hoists, Some recent, 1023
" Some American brake, 365
Thermal storage tank, The, 516
Three-phase alternator, by Ganz & Co., 532
" distribution for small installations, Relative advantages of direct current and, by H. A. Earle, 886
" induction motors, A new method of starting, by W. G. Rhodes, 372
Third rail railway, A, 1012
Thunderstorm load curve, A, 349
Tommasi, Dr. D., on An Arrangement intended to prevent the interception of despatches in wireless telegraphy, 46
Town councillors, The responsibilities of, 737
Towns' refuse problem, The, 24

TRACTION NOTES—
Aberdeen, 308, 342, 553, 784
Adelaide, 140
Airdrie, 634
American practice, 359
Amsterdam, 908
Antwerp, 908
Ashton-under-Lyne, 553, 703
Austria, 869
Automobile electric traction from Modena to Bologna, 917
Ayr, 30*, 942
Bangkok, 462
Barton, 431
Bath, 99, 178
Batley, 379
Battery, 473
Beckenham, 826
Belgium, 703, 869
Berlin, 826
Bermondsey, 99, 140
Bexley and Erith, 869
Birkenhead, 19, 261, 635, 703, 908
" and Wirral (Cheshire), 869
Birmingham, 261, 662
Black country, 19, 261
Blackburn, 221, 584
Blackpool, 379, 584
Bolton, 226, 634, 988, 1032
Bombay, 945
Bootle, 60, 908
Bournemouth, 140, 784
Bowness, 261
Bradford, 19, 431, 703
Brighton, 308, 463, 512, 662, 784
Bristol, 512, 662, 945
Brussels, 869
Buenos Aires, 99, 140
Bulgaria, 662
Burnley, 220, 584
Bury, 140, 635
Calais, 908
Canal, 555, 908
Cardiff, 462, 572, 553, 635, 703, 743, 784, 908, 945, 988
Carlisle, 703
Carnarvon, 60, 221, 553
Ceylon, 869
Chester, 635
City and South London Railway, 381
Cl ethorpes, 308, 763
Clydebank, 826
Colchester, 585
Colne, 832
Cologne-Dusseldorf, 308
Coventry, 989
Cradley Heath, 99
" -Netherton, 662

TRACTION NOTES—*continued.*
Crewe, 431, 463, 784
Darlaston, 140
Darlington, 261, 703
Dartford, 743, 849
Darwen, 553, 908
Derby, 220
Dewsbury, 869
Dublin, 178, 743, 832, 908, 945, 1032
" -Howth, 178
Dudley, 140, 178, 221
Dundalk, 703
Dundee, 99, 308, 553, 832
Durham, 342
Eastbourne, 99
East Ham, 989
Eccles, 19, 221
Edinburgh, 585, 832
" cable system, The, 261
Falkirk, 663
Farnworth, 6
Folkestone, 635, 869
France, 703, 869
Germany, 221, 463, 743
Glasgow, 380, 512, 553, 585, 772
Glossop, 585
Gloucester, 703
Gosport, 99, 262, 463
Gourock, 743
Govan, 60
Grand Rapids, 512
Great Yarmouth, 553
Grimsby and Cleethorpes, 763
Halifax, 262, 431
Ham, 342
Hawaii, 512
Hayling Island, 179
Hendon and Finchley, 832
Herne Bay, 463
Holland, 431, 43
Huddersfield, 512
Hull, 663
Hungary, 703
Hyde, 512
Hyderabad (Deccan), 221
Ilford-Ham, 342
Italy, 140, 585, 704, 870, 896, 944, 989
Jarrow-South Shields, 635
Johnstone, 635
Kearsley, 308
Kidderminster, 663
Kilmarnock, 463
Kingston, 179, 512, 663, 870
Kirkcaldy, 60, 463
Lake District, 380, 512, 555, 743
Lancaster, 141, 179
Leamington and Warwick, 870
Leeds, 221, 431, 463, 989
Leicester, 989
Limerick, 704
Lincoln, 944
Liverpool, 60, 141, 221, 262, 308, 342, 380, 431, 512, 663, 704, 743, 832, 870, 908, 945, 989
" -Bootle, 221
Llandudno, 663
Llanelly, 308, 704
London, 107, 140, 179, 463, 945
L.C.C. 140, 743, 991
Maidstone, 141, 553
Malvern Hills, 262
Manchester, 19, 141, 431, 832, 870, 908, 945
Merthyr, 743
Metropolitan, 149, 189, 836, 917
Middlesex, 19, 512, 870
Middleton, 60, 221, 945
Midlands, 431
Mitcham and Croydon, 743
Morecambe, 221, 262
Moss Side, 99
Musselburgh, 19
Nelson, 431
Netherton, 553
Newcastle-upon-Tyne, 518
New Forest, 19
" Malden, 784, 945
" York, 518
Newport (Mon.), 60, 141, 262, 463, 585, 635, 663
Northampton, 553
North Wirral, 945
Norwich, 179, 347
Nottingham, 221, 832, 870, 945
Oldham, 221, 518, 635, 663, 704, 945
Ormskirk and Southport, 463
Paisley, 663, 703
Paris, 99, 141, 431
Piedmont, 908
Placenza (Italy), 946
Plymouth, 704, 743
Pontefract 832
Pontypridd, 784
Portsmouth, 60, 431, 585, 635, 704
Powers, 832, 868, 905
Pwllheli, 19
Radcliffe, 832
Redcar, 636
Rhondda, 308, 713
Rhyl, 60, 100, 500, 636, 743
Richmond, 1042
Roumania, 904, 989
Royton, 308
Runcorn-Warrington, 913
Russia, 221, 989
St. Helens, 463, 553, 713
Salford, 221, 663
Scarborough, 793, 832
Sheffield, 870, 913
South Carnarvonshire, 221
Southampton, 100, 141, 179, 347, 463, 908
Southend, 224, 553
South Lancashire, 308, 347, 870
" Shields-Jarrow, 635
Southport, 107, 585, 946

TRACTION NOTES—*continued.*
Spain, 431, 870
Spen Valley, 793, 989
Staffordshire, 221, 585
Staines, 713
Stirling, 585, 989
Stretford, 308
Sunderland, 262, 268, 347, 914
Surbiton, 793
Surrey, 141, 347, 380, 512
Sutton and Howth, 262
Swansea, 19, 100, 713
Taunton, 664
Torquay, 513
Valentia (Spain), 221
Vienna, 748
Walker, 222
Walsall, 463, 513
Warrington, 179
Wednesbury, 513
West Bromwich, 743, 793
" Cumberland, 347
Wigan, 222, 432, 664, 743
Willenhall, 636, 793
Wimbledon, 793
Windermere, 432, 463
Wolverhampton, 60, 553, 713, 743
Workington, 946
Wrexham, 141, 222, 380, 832
Wycombe, 636
York, 1032

Trade in engineering, The balance of, 844
" union, The responsibility of a, 524
" unions, The law of, 849
Training of mechanical engineers, The, 569
Tramcar details, Malleable iron for, 453

TRAMWAY(S)—
Bradford Corporation contracts, 214, 253
Buenos Ayres, The electric lighting and tramways of, 61, 95, 229, 265
Closed conduit, 676
Combined lighting and traction stations, 2, 67
Conduit system, Development of the, 1043
Construction, with special reference to the Demerbe system, Recent, by W. Dawson, 521
Deadlock, The, 969
Electric and suburban industries, 434
" by R. Kennedy, 79
" traction under steam railway conditions, 281
Exhibition, Electric 36
Government observatories and electrical tract on, 716
Horse and electric, at Glasgow, 82
Housing electric, 836
Impressions of American practice, by A. E. Le Rossignol, 118
Indispensable accessories for, by H. E. P. Cottrell, 240, 297, 492
International Congress at Paris, 473
Italian Southern Railway Co., Application of electric traction to the lines of the, 646
Lessons of the Exhibition, 1
Life guard for, 556
Load factors on traction stations, by W. H. Booth, 362
Municipal electric, 121
New York's latest system, 685
Norwich electric, 143, 185
Paderno electric, 531
Profits on tramway undertakings, by C. H. Gadsby, 75
Progress, Electric traction, 811
Schemes for London, New electric, 168, 380
Southampton electric, 108
Statistics, 894
Sunderland electric, 303
Swansea electric, 909
Sydney (N.S.W.), by A. F. Webb, 745, 790
Systems of current distribution on, 723, 891
Track, The maintenance of an electric, 22
Working costs on the Leeds City Tramways, 843

Transformer core deterioration, 516
" litigation, 991
Transmission by shafting *v.* electricity, Power, 501
" of direct and alternating currents, Copper saving in the joint, by F. Bedell, 32
" plants at Moodie's Gold Mines, Mr. Heather's paper on The Electric, by E. K. Scott, 533
Transporter, The Temperley fuel, 937
Trials, Electric motor car, 765
" of electrical vehicles, 755
Trolley and surface contact tramway, The Bois de Boulogne combined, 2 0
" Conduit *v.*, 245, 287, 286
Turbine at Elberfeld, Steam, 571
" Economies of superheated steam in the steam, 351, 454
Turbo-alternators for Frankfort, 97

UNDERGROUND London, 360
Unions of State employés, The, 766
Usage factor of plant, The, 655

VACUUM drying apparatus, 815
Vandergrift, 891
Variations in the current through the direct current arc, On rapid, by W. Duddell, 999, 1038
Vehicles, The automobile club trials of electrical, 816
Viagraph, The, 515
Vibrations, Apparatus for the detection and registration of electrical, by A. C. Popoff, 845, 882
" caused by motors, Practical methods of overcoming the, by S. Cowper-Coles 811
Voltaic cells, Reversibility of, 189
Volunteers, Electrical, 68, 247, 255, 280, 571, 633, 671, 675, 716, 753, 792, 836, 873, 917, 950, 982

WARRILOW, W. E., on Water loads for electricity works, 1011
Waste heat of gas engines, Utilising the, 296
Water loads for electricity works, by W. E. Warrilow, 1011
" -power governing, 514
" -tube boiler, The coal-eating, 756
" -tube boiler, The Cummins, 540
" -tube boiler, The Weir, 440
" -tube Boilers Committee, The, 349
" -tube boilers in the Navy, 125
Wattmeter and maximum demand indicator, A combination integrating, by J. H. Barker, 418
Waves along parallel wires, Propagation of electric, 516
Weir water-tube boiler, The, 440
Wheels slip, Why electric car, by E. C. Parham, 652
Whipple, R. S., on Note on an improved standard resistance, 523
Wilkinson, G., on The distribution of electricity, 31
Wills, 312, 394, 795
Wireless telegraphy, 23, 60, 142, 180, 309, 348, 513, 516, 560, 714, 744, 794, 871, 914, 917, 946
" telegraphy and lighthouses, 100
" telegraphy, Arrangement intended to prevent the interception of despatches in, by Dr. D. Tommasi, 46
" telegraphy in the recent naval manœuvres, 406
" telegraphy in the Mediterranean, 530
" telegraphy, The Slaby-Arco system of, 335, 1034
" telegraphy with repeaters, by E. Guarini and Lieut. Poncelet, 775
" telephony, by Sir W. H. Preece, 484
" telephony in 1876, 592
Wiring, Bad, 340
" Interior, by G. C. Allingham, 491
" practice, American, 650
" rules, 375
Woodfield, S., on Overhead construction, with special reference to guard wires, 448
Workmen's compensation, 810
" compensation cases, 413
Works of Ludw. Loewe & Co., The tool, 668, 690, 709, 788, 851
World's coal, The, 609
Wright, J., on A comparison of English and American practice in cable manufacture, 732
" J., on The ethics of insulating materials, 454
" J., on Notes on the testing of modern dielectrics at high voltages, 653
" J., on The possibilities of electric smoke deposition, 811

YORKSHIRE iron, 357

# INDEX—SPECIFICATIONS.

## 1898.


ABEL, C. D. (18,941. Allgemeine Electricitäts Gesellschaft), 364; (21,165. La Société Anonyme pour la Transmission de la Force par l'Electricité), 404; (25,314), 528; (27,390. Société Anonyme Continentale pour la Fabrication des Compteurs à Gaz et Autres Appareils), 768
Addenbrooke, G. L. (25,753), 648
Aitken, W. (19,071), 364
Alcock, A. N. (24,855), 528
Anders, G. L., and Wilson, A. J. (20,972), 444
Anderson, J., and Lundquist, F. A. (17,881), 168
Andersson, H. E. (26,769), 728
Andreas, Dr. E. (16,999), 84; (17,507), 84; (22,884), 608
Andrews, J. D. F. (22,794), 608
Armstrong, G. (16,267), 488
Arter, A. W. (27,636), 892
Aspinwall, L. M. (20,259), 168

BACHMANN, J. F., Vogt, A., and others (18,231), 204; (18,232), 204
Baily, F. G. (17,647), 124
Barbier, N. F. D. (20,814), 403
Baresch, E., Baresch, R. M. A., Tosler, E. M., and Zabern, W. von (22,115), 568
Barnikol-Veit, A. B., and Riebel, A. W. (22,887), 648
Barschall, M. (58), 568
Bartenstein, C. (19,555), 244
Barton, G. D. (23,837), 892
" J. H., and Stuart, J. (21,638), 444
Bastick, J. (19,116), 364
Beadle, A. A. (17,458), 84
Beaumont, F. J. (21,941), 488
Behrend, O. (17,268), 84
Belfield, R. (19,960. Foreign Electric Traction Co.), 284; (18,582. B. G. Lamme), 808; (18,583), 848
Bell, F. G., and Byng, M. (20,661), 164
Benedict, A. J. (16,556. W. S. Doe), 83
Bevis, H., and Hirst, H. (24,139), 324
" H., and Mordey, W. M. (27,268), 768
Birberstein, C. (16,754), 84
Blackburn, A. B., and Spence, W. S. (19,636), 244
Blackwell, R. W. (20,532), 164
Blanckenhorn, W. (18,907), 364
Blathy, O. T. (26,251), 688
Blumenberg, H., jun. (19,445), 244; (21,364), 444
Bocquentin, A. (20,829), 403
Bolte, C. (24,795. G. Brandt), 488
Booker, F. (17,889), 168
Boult, A. J. (17,588. V. Busson), 163; (18,165. V. J. Busson and E. F. Busson); 164
Bowles, E. W. (24,070), 404
Bradley, W. H. (24,164), 324
Brault, C. (26,343), 728
Bray, W. H. (26,314), 688
Brecher, A., Kittel, A., and Jung, C. (26,397), 688
Brecknell, H., Rogers, H. J., and Munro, E. M. (22,664), 608
Bremer, H. (16,552), 40; (16,553), 40
Brennecke, O., and Timar, I. (25,023), 488
Brerat, F. F., and Delaran, H. (22,844), 568
Brien, J. G. (18,729) 363
Britannia Motor Carriage Company, and Smith, J. (18,213), 204
British Thomson-Houston Co. (16,715. C. P. Steinmetz), 83; (24,371), 324; (16,716. E. W. Rice, jun.), 83; (16,717. F. E. Case), 83; (19,940. E. M. Hewlett), 284; (21,048. Ectilo), 364; (21,044. T. P. Cox), 404; (21,046. A. G. Davis), 404; (21,047. W. L. Emmet), 404; (21,043. E. W. Rice), 444; (22,079. A. L. Rohrer), 528; (22,080. E. M. Hewlett), 568; (22,081. E. Thomson), 568; (23,082. H. Geisenhoener), 568; (22,600. G. B. Painter), 608; (27,598. F. E. Case), 768; (23,529. C. M. Green), 848; (23,530), 848; (23,531), 848; (23,534. F. E. Case), 848; (23,533. C. E. Harthan), 848; (23,534. S. H. Libbey and W. P. Potter), 892; (23,958. E. Thomson), 892
Brown, S. G. (18,261), 204; (23,750), 892
Bugg, jun., O. T., and Darling, D. H. (17,583), 124; (17,592), 124
Bullock, G. (20,677), 164
Burke, J. (19,537), 244; (19,014), 364
Burnand, W. E. (26,723), 728
Burroughs, E. (26,746), 728
Burt, L. N., and Prestwick, E. E. (22,858), 608
Busher, J. A. (4,278), 568
Busk, W. (23,148), 648
Byng, M. (22,419), 568
" and Bell, F. G. (20,661), 164

CAKE, E., and Machin, T. (17,741), 124
Callow, C. B., and Eck, J. (26,164), 688
Campbell, J. B. (17,705), 124
Canfield, F. W. (25,479), 528
Canning, T. R., and Thornton, J. (21,233), 444
Cante, C. (19,264), 204; (19,265), 204
Capewell, S. J. (18,552), 808; (18,557), 848
Case, F. E. (20,274), 168; (21,758), 488
Cater, J. M. I., and Wilson, E. (24,104), 404
" " and Highfield, J. S. (22,181), 568
Cawley, G., and Thwaite, B. H. (17,378), 488
Christy, F., and Christy, L. F. (25,746), 608
Clark, A. M. (21,317. Metallurgische Gesellschaft, A.G.), 444
" E. J. (16,876), 84; (26,526), 728
" G. A., McAulay, W., and McLaren, J. A. (26,310), 688
Cohn, M., and Horvath, R. von (20,794), 408
Coiney, L. de (26,257), 688; (26,322), 688
Conrad, F., and Davis, H. P. (20,440), 164
Cotterell, M. B. (19,824), 284
Cowan, E. W., and Still, A. (26,191), 727
Cowper-Coles, S. O. (21,974), 488
Cox, C. H. (14,514), 488
Crawley, C. W. S. (19,621), 244; (21,655), 444
Crompton, R. E. B. (24,812), 488
" " and Pochin, E. A. N. (26,610), 728
Crowdus, W. A. (19,632) 244; (19,788), 284

DANNERT, F. (19,974), 284
Darcy, C. (27,599), 848
Darling, D. H., and Bugg, jun., O. T. (17,583), 124; (17,592), 124
D'Asar, M. R. (22,959), 568
Davies, G. T. (20,823), 403
Davies, W. H., White, H., and Patterson, A. (17,529), 488
Davis, H. P. (18,584), 848
" " and Conrad, F. (20,440), 164
Delaran, H., and Brerat, F. F. (22,844), 568
Douglass, A. D. (20,027), 284
Drew, A. E. (18,024), 164
Ducousso, T. (20,202), 403

EBBUTT, P. G., and Veritys, Ltd. (25,895), 688; (25,896), 688
Echtermeyer, R. (25,217), 528
Eck, J. (25,417), 528
" and Callow, C. B. (26,164), 688
Edgerton, N. H., and Masters, A. H. (24,641), 324
Edmondson, J. A., and Preece, T. (16,488), 40
Edmunds, H. (22,700), 608
Edser, E. (18,358), 364
Egger, E. (27,586), 768
Electric Fog Signal Syndicate and Sykes, W. R. (23,410), 648
" Motive Power Co., The, Northey, P. W. (22,027), 84
Elpinstone, G. K. B., and Heap, A. C. (18,272), 488
Evans, A. F. (18,854), 364

FEENY, V. I. (26,798. Allgemeine Elektricitäts Gesellschaft), 728; (26,790), 728
Feldmann, C. (22,777), 608
Fell, J. C. (24,307. W. Strzoda), 324
Ferguson, J., and White, J. (21,715), 488
" W. G., and Stumps, W. G. H. (26,334), 728
Fleming, J. A. (22,071), 568
Foy, F. (27,053), 768
Francis, F. W. (26,604), 728
Francois, C. E., Louberg, C. R., and Kundelmann, H. G. (27,269), 768
Frank, J. (16,114), 40
Fry, H. E., Steinhart, O. J., and Vogel, J. L. F. (19,876), 443

GARNHAM, J. C., and Harper, R. R. (20,685), 164
Geipel, W. (17,529), 124
Gent, W. A., Richardson, J. S., and Jevons, S. (19,688), 244
Gibbings, A. H., and Kay, J. (20,221), 163; (19,348), 244
Gibbs, J. W. (26,948), 688
Gillespie, A. E., and Gillespie, J. (23,821), 892
Giorgi, G. (24,992), 528
Girard, C. V., and Houpied, E. (24,747), 404
Golby, F. W. (22,959. Di. J. B. I. de Constant), 648
Graeber, J. H., and Tobler, H. (22,171), 568
Graham, A. (18,806), 364
Greenfield, E. T. (24,655), 404

HACKETHAL, L. (24,404), 324
Hadden, H. J. (24,308. Columbus Elektricitats Gesellschaft, mb. H.), 324
Haefiner, J. A., and Volgt, H. J. F. (20,353), 164
Hanchett, G. T., and Sage, F. B. (24,965), 528
Harding, J., and Milner, J. W. (18,087), 164
Hardingham, G. M. (25,095), 528
Hardy, E., and Picard, R. (24,626), 324
Harper, R. R., and Garnham, J. (20,685), 164
Harrison, H. T. (16,120), 488; (26,703), 728
Hartnell, W. (13,325), 488
Hartvigson, S. L. (23,411), 648
Headland, H. W., Headland, H. W., jun., Robson, J. T., and Marsden, C. H. (16,485), 40
Heap, A. C., and Elphinstone, G. K. B. (18,272), 488
Heebner, S. Y. (27,320), 768
Helberg, Dr. E. (16,659), 83
Hellstrom, B. Q. V. (20,262), 163
Henneton, A. (16,464), 40
Henley's Telegraph Works Co., W. T. and Wright, R. O. (21,005), 404
Heys, W. G. (19,913. Manhattan Genera Construction Co.), 284; (22,130. J. J. Heilmann), 568; (22,928. H. L. Linder), 648; (26,026. S. Silberberg), 688
Highfield, J. S., and Cater, J. M. (22,181), 568
Hirst, H. (24,264), 324; (24,265), 324
" H., and Bevis, H. (24,133), 324
Holmes, A. B. (20,393), 164
Hookham, G. (15,972), 40; (21,633), 444
Hooper, J. (19,972), 284
Hope, J. H. (7,764), 808
Horvath, R. von, and Cohn, M. (20,794 408
Horwitz, L. (18,057), 204
Houpied, E., and Girard, C. V. (24,747 404
Howard, C. (27,613), 848
Howell, J. C., and The Porous Accumulator Co. (26,886), 768
Hummel, E. A. (17,080), 84
Hungerbuhler, E. (21,150), 404
Hutchison, R. (21,410), 444

IMRAY, O. (16,120), 40; (17,580. Dr C. A. von Welsbach), 124; (13,116 C. A. von Welsbach), 487
Irish, W. E. (27,074), 768

JEVONS, S., Gent, W. A., and Richardson, J. S. (19,688), 244
Johnson, G. W. (20,446. S. Hutchins) 164
" J., and Price, J. (19,255), 204
" J. Y. (25,302), 528
Johnston, J. Y. (22,461. H. J. Dereum) 568
Jung, C., Brecher, A., and Kittel, A (26,397), 688
Justice, P. M. (27,335. A. T. Nye), 768
Juvenet, J. P. (21,155. E. M. D. de Siblas), 404

KAHRS, C. H. (24,196), 324
Kaldegg, M. R., and Tuma, Dr. J. (23,820), 892
Kay, J., and Gibbings, A. H. (20,221), 163; (19,348), 244
Kellner, C. (19,785), 244
Kelvin of Largs, Baron W. Thomson (21,716), 488
Kennedy, R., and Wollaston, H. A. (21,524), 444
Kenney, F. D., and Morten, W. V. (16,449), 40
Kingsbury, J. E. (18,613. Western Electric Co.), 848
Kirsten, C. P. (17,817), 124
Kittel, A., Jung, C., and Brecher, A. (26,397), 688
Kohl, M. (16,299), 40
Kolischer, F., Landmann, A., and Prendek, F. O. (19,418), 204

Kundelmann, H. G., Francois, C. E., and Lonberg, C. R. (27,269), 768
Kustermann, J. (19,491), 244
Kynaston, J. W. (15,967), 40

LAKE, H. H. (24,190. W. M. Scott), 324; (19,855. Soc., Roger and Rathier), 284; (10,608. P. C. F. Hoffmann), 244; (17,659. E. Bergmann), 124; (16,902. Société Anonyme des Horloges Electriques Caudersay), 84; (17,591. Compagnie de L'Industrie Electrique), 124; (26,527. H. S. Maxim), 728; (23,503. H. See), 848; (23,510. A. H. Spencer), 848
Lambert, W. R. (17,880), 168
Lamme, B. G. (19,246), 204
Landmann, A., Prendek, F. O., and Kolischer, F. (19,418), 204
Langdon-Davies, W. (24,418), 324
Lavison, H. de R. de (16,172), 40
Lawton, M. (20,008. Trading as J. Lawton & Sons), 323
Lehner, K. (26,186), 688
Leimer, E. (15,801), 488
Leissing, J. C. (23,706), 892
Leitner, H. (27,453), 768
Levavasseur, L. M. J. C. (16,291), 40
Levetus, C. (23,306), 648
Loiselet, J. (22,872), 608
Lombard-Gerin, S. (21,216), 444
Long, F. M., and Schattner, E. (22,603), 608
Lorintz, J., and Schafer, J. C. (17,191), 84
Louberg, C. R., Kundelmann, H. G., and Francois, C. E. (27,369), 768
Love, J. C. (18,754), 864
Lundberg, A. P., and Lundberg, G. C. (19,076), 864
Lundquist, F. A., and Anderson, J. (17,881), 169
Lyon, H. (16,595), 83

MACHIN, T., and Cake, E. (17,741), 124
MacLagan, D. (16,896), 40
Maiche, Ltd. (17,517. L. Maiche), 124
Major, C. G., Stevens, E. C., and Stevens, J. S. (21,201), 444
Maple, Bart., M.P., Sir J. B., Verity, J., and Steele, L. J. (22,802), 608; (22,803), 608; (23,420), 648
Maquay, S. W., and Vanderpump, P. E. (19,535), 244; (19,536), 244
Marcay, J. E., de (21,829), 488
Marino, J. (22,622), 608
Markt, G. (17,371), 84; (22,537), 568
Marsden, C. H., Headland, H. W., Headland, H. W., jun., and Robson, J. T. (16,485), 40
Martini, D. (14,714), 488
Masters, A. H., and Edgerton, N. H. (24,641), 324
Matthias, J. (27,526), 768
Mavor, H. A., Mavor & Coulson, and Sayers, W. B. (22,699), 608
McAulay, McLaren, J. A., and Clark, G. A. (26,310), 688
McEwan, T. (16,979), 84; (19,500), 204
McLaren, J., and McLaren, H. (20,531. E. W. Nayler), 164
McMillen, F. C, (17,161), 84
Mechan, H., and Muirhead, D. (21,125), 404
Mersch, P. (19,309), 244
Merriman, W. H. (23,497), 848
Millar, T. (24,887), 528
Mills, B. J. B. (24,532. La Société Francaise des Cables Electrique Systeme Berthond, Borel et Cie), 324; (18,475. T. A. Edison), 808
Milner, J. W., and Harding, J. (18,087) 164
Moeller, J. F. L., and Street, E. A. G. (18,743), 864
Mordey, W. M., and Bevis, H. (27,268), 768
Morris, H. G., and Salom, P. G. (24,559), 324
Morten, W. V., and Kenney, F. D. (16,449), 40
Muirhead, A. (12,731), 808
" D., and Mechan, H. (21,125), 404
" F. L. (24,379), 324
Mulmann, O. von (17,692), 124
Munro, E. M., Brecknell, H., and Rogers, H. J. (22,664), 608
Murphy, J. M. (24,051), 84; (24,052), 404; (24,053), 404; (26,315), 688
Mutual Electric Trust, and Reason, H. (17,026), 84; (17,764), 124

NAHORSKY, W. (16,908), 84
Neid, H. W. (19,875), 284
Neumann, F. (24,125), 404
Newton, P. A. (16,734. H. G.), Carleton, 83
Niblett, J. T., and Sutherland, M. (17,780), 124
Northey, P. W., and The Electric Motive Power Co. (22,027), 84

OBACH, E. F. A., and Siemens Bros. and Co. (20,528), 164
Obst, R. (25,259), 528
Ogden, P. (19,110), 364
Oliver, C. (17,601), 124
Othesen, H. R. (27,097), 768

PASSBURG, E. (17,597), 124; (17,198), 488
Patterson, A., Davies, W. H., and White, H. (17,529), 488
Pegelow, F. (20,208), 444
Pellenz, C. (25,961), 688
Peloux, A. (23,384), 648
Penning-Dapuis, E. (26,629), 768
Petersen, C. U. E. (16,884), 84
Phillips, E. B., and Bray, W. H. (26,214), 688
Picard, R., and Hardy, E. (24,626) 324
Pichard, P. (25,985), 688
Pitt, S. (17,896. L. W. Gans), 163; (21,307. The Pharmaceutisches Institut Ludwig Wilheim Gans), 444; (22,686. Elektricitäts Aktiengesellschaft vormals Schuckert and Co ), 608
Pollak, C. (18,941), 364
Pomeroy, B. H. (19,827), 284; (19,828), 284
Porous Accumulator Co., and Howell, J. C. (26,886), 768
Potter, W. B. (20,276), 164
" W. P. (21,550), 444; (21,759), 488
Preece, T., and Edmondson, J. A. (16,488), 40
Preismann, E. (26,930), 768
Prendek, F. O., Kolischer, F., and Landmann, A. (19,418), 204
Preston, E. J., care of J. Stone & Co. (12,431. Gould Coupler Co.), 528
Prestwick, E. E., and Burt, L. N. (22,858), 608
Price, J., and Johnson, J. (19,255), 204
" W. A. (24,727), 404
Procter, C. F. (26,067), 688]

RABBIDGE, P. (19,162), 364
Rainsford, R., (26,458), 728
Ransford, R. B. (27,370. Société Sautter Harle et Cie), 768
Raster, E. O. (21,374), 444
Rawson, W. L. (24,570), 324
Reason, H., and The Mutual Electric Trust (17,026), 84; (17,764), 124
Rice, jun., E. W. (21,551), 444
Richardson, J. S., Jevons, S., and Gent, W. A. (19,688), 244
Riebel, A. W., and Barnikol-Veit, A. B. (22,887), 648
Rinraide, S. B. (25,670), 528
Robertson, jun., D. (23,659), 892
Robson, J. T., Marsden, C. H., Headland, H.W., and Headland, H.W., jun. (16,485), 40
Rogers, H. J., Munro, E. M., and Brecknell, H. (22,664), 608
Rosi, E., and Vacotti, O. G. (21,224), 444
Rowe, N. (18,366), 848
Rudd, R. J. (19,837), 204

SAGE, F. B., and Hanchett, G. T. (24,965), 528
Salom, P. G., and Morris, H. G. (24,559), 324
Sayers, W. B., Mavor, H. A., and Mavor and Coulson (22,699), 608
Schafer, J. C., and Lorintz, J. (17,191), 84
Schanschieff, A. (18,702), 363
Schattner, E., and Long, F. M. (22,603), 608
Schlatter, Prof. A. (23,160), 648
Schloss (24,172), 324
Schmidlin, C. (24,115), 324
Schnee, C. E. (26,401), 728
Schneider, O. (24,550), 324
Scott, C. F. (19,959), 284
Shiels, A. (16,871), 84; (18,894), 364; (18,630), 848
Short, L. (22,768), 608
" S. H. (24,833), 528
Siemens Bros. & Co. and Obach, E. F. A. (20,528), 164
" Bros. & Co. (17,974. Siemens and Halske Aktien Gesellschaft), 164; (18,740), 363; (24,949), 528; (25,567), 528; (25,863), 688; (26,068), 688; (26,153), 688; (26,649), 728
Simms, F. R. (24,859), 528
Smith, J., and The Britannia Motor Carriage Co. (18,213), 204
" S. H., and Smith, J. H. (19,313), 204
" W. F. (17,145), 84
" W. R. (24,982), 528
Snow, F. P. (15,300), 488
Société "Les Fils d'Adolpho Mougin," La (20,759), 403
Solomon, H. G. (25,058), 528
Spence, W. S., and Blackburn, A. B. (19,636), 244
Stamp, W. V. (25,764), 648
Standebach, C. F. P. (18,137), 164
Stassano, E. (11,604), 568
Stead, C. M. (24,488), 324
Steele, L. J. (12,784), 808
Steele, L. J., Maple, Bart., M.P., Sir J. B., and Verity, J. (22,802), 608; (22,803), 608; (23,420), 648
" " and Veritys, Limited (16,460), 40; (21,467), 444
Steiner, C. (24,487), 324
Steinhart, O. J., Vogel, J. L. F., and Fry, H. E. (19,876), 443
Stephen, J. (17,921), 164
Stevens, J. S., and Major, C. G., and Stevens, E. C. (21,201), 444
Stewart, W. N., and Wells, H. H. (24,466), 324
Still, A., and Cowan, E. W. (26,191), 727
" W. J. (21,835), 164
Street, E. A. G., and Moeller, J. F. L. (18,743), 364
Stuart, J., and Barton, J. H. (21,638), 444
Stumps, W. G. H., and Ferguson, W. G. (26,834), 728
Sturg, W. H. (23,183), 648; (11,326), 808
Stuttmann, A. (22,987), 648
Sutherland, M., and Nilbett, J. T. (17,780), 124
Sykes, W. R., and The Electric Fog Signal Syndicate, (23,410), 648

TAYLOR, J., and Taylor, W. (20,496), 164
" T. (26,738), 728
Tesla, N. (26,371), 728
Thompson, S. P. (25,098), 528
" W. B. (26,806), 768
" W. P. (17,163. E. Berliner, and J. Sanders), 84; (24,533. C. S. Bradley), 324; (23,288. C. H. Kahrs), 404; (22,037. J. Schmidt), 528; (22,545. The Strowger Automatic Telephone Exchange), 568; (23,430. I. von Zweigbergk), 648; (25,955. H. S. Elsworthy), 688; (26,619. F. F. Ahern), 728
Thomson, E. (20,275), 164
" W. (18,522), 808
Thornton, J., and Canning, T. R. (21,233), 444
Thwaite, B. H., and Cawley, G. (17,378), 488
Timar, I., and Brennecke, C. (25,023), 488
Tobler, H., and Graeber, J. H. (22,171), 568
Tosler, E. M. Zabern, W. von, Baresch, E., and Baresch, R. M. A. (22,115), 568
Towle, J. W. (20,850), 404; (12,461), 528
Tschernoff, D. (26,154), 84
Tschieret, J. T. (9,607), 808
Tuld, M. E. (18,847), 364
Tuma, Dr. J., and Kaldegg, M. R. (23,820), 892
Turnbull, jun., C. (18,309), 808
Turner, A. K, (12,681) 528

VANDERPUMP, P. E., and Maquay, S. W. (19,535), 244; (19,536), 244
Varicas, L., and Varicas, C. J. (27,128), 768
Verity, J., Steele, L. J., and Maple, Bart., M.P., Sir J. B. (22,802), 608; (22,803), 608; (23,420), 648
Veritys, Limited, and Ebbutt, P. G. (25,895), 688; (25,896), 688
" Limited, and Steele, L. J. (16,460), 40; (21,467), 444
Vocatti, G., and Rosi, E. (21,224), 444
Vogel, J. L. F., Fry, H. E., and Steinhart, C. J. (19,876), 443
Vogt, A. (18,156), 204
" A., Bachmann, J. F., and others (18,231), 204; (18,232), 204
Volgt, H. J. F., and Haefiner, J. A. (20,353), 164

WAKELIN. J. F., and Weston, C. J. (27,541), 848
Walker, H. J. (17,013), 84
" S. F. (12,365), 527
Walter, L. H. (23,624), 892
Watson, A. (17,626), 124; (20,227), 163; (26,494), 728
Wells, H. H., and Stewart, W. N. (24,466), 324
Weston, C. J., and Wakelin, J. F. (27,541), 848
Wetter, J. (23,233. Electricitäts Aktiengesellschaft vormals Schukert and Co.), 648; (26,351. M. Mass), 728
Wheatley, A. J. (15,235), 40
" W. H. (19,644. L. Rosenfeld, C. Zelenay, and J. Dulalt), 244
White, H., Patterson, A., and Davies, W. H. (17,529), 488
" J., and Ferguson, J. (21,715), 488
Wild, A. G. (22,449), 568
Wilkinson, G. (22,190), 568
Wilson, A. J., and Anders, G. L. (20,972), 444
" E., and Cater, J. McI. (24,104), 404
" H. W. (18,172), 204
Winton, A. (18,807), 364
Wise, W. L. (20,048. Actiengesellschaft elektricitatswerk vorm O. L. Kummer & Co.), 364; (23,556. A. C. Crehore, and G. O. Squier), 892

WOLLASTON, H. A., and Kennedy, R. (21,524), 444
Wright, R. O., and Henley's Telegraph Works Co., W. T. (21,005), 404

ZABERN, W. Von, Baresch, E. Baresch, R. M. A., and Tosler, E. M. (22,115), 568


## 1899.


ABEL, C. D. (517. Siemens & Halske Aktien-Gesellschaft), 968
Alcock, A. U. (934), 1008

B., I. E., and Hall, jun., F. G. (14,774), 968
Bacon, D. (11,428), 928
Barman, A. (416), 1048
Barnes, J. E. L., and Sloan, R. A. (1,044), 1048
Bergmann, E. (12,693), 968
Berresford, A. W. (14,293), 968
Blackwell, jun., H. F., and Blackwell, M. A. (1,673), 1048
Bliss, W. L. (12,869), 928
Blunck, J. H., and Wulff, H. P. J. (14,877), 968
Boult, A. J. (13,526. F. H. Daniels, United States), 928; (16,997. F. H. Daniels), 1008
British Thomson-Houston Co. (13,802. E. Thomson and F. P. Cox, United States), 892
Brown, S. G. (1,434), 1048
Bruns, L. J., and Ottesen, H. R. (15,203), 968
Burke, J. (13,431), 892; (16,966), 1008
Byng, M., and Eidsforth, R. P. (1,106), 1048

CALLMANN, W. C. (14,300), 968
Clink, D. K., Reed, G. J., Freed, F., and Freed, I. (513), 928
Condict, G. H. (5,838), 928
Cox, F. P. (655), 1008; (656), 1008
" H. B. (8,172), 198
Crookes, J., and Spagnoletti, J. E. (9,672), 968
Crudgington, W. (962), 1048
Cutter, H. B. (1,826), 968

DANEILS, F. H. (15,189), 968
Davidson, A. (1,487), 1048
Davis, E. (14,547), 968
Davy, W. J. (918), 1008

EARLE, H. A. (14,838), 968
Eckstein, A., and Eidsforth, R. P. (405), 1048
" A., and Guthrie, W. A. (903), 1008
Eidsforth, R. P., and Eckstein, A. (405), 1048
" R. P., and Byng, M. (1,106), 1048
Elicson, C. P., and Naylor, W. S. (1,230), 1048
Ericsson, L. M. (3,591), 892
Evershed & Vignoles, Ltd., and Evershed, S. (1,758), 1048

FERRIERA, L. de M. G., and Pryce, H. G. (214), 1047
Fitzpatrick, H. D. (11,010. G. Brandt), 928
Franzen, C. (635), 1009
Freed, F., Freed, I., Clink, D. K., and Reed, G. J. (513), 928
Fremot, E. (15,488), 1008

GANS, L. W. (356), 1048
Gardener, G. (15,460), 968
Gooch, F. A. (16,555), 1008
Gould, C. A. (11,070), 928
Greenfield, E. T. (8,045), 928
" W. E. (8,044), 892

HALL, jun., F. G., and I. E. B. (14,774), 968
Halsey, E. S. (12,635), 928
Hansmann, W., and Ritter, H. (13,955), 968
Harfield, W. H. (44), 1047
Harris, A. F. (825) 1008
Heebner, S. Y. (14,794), 968
Highfield, J. S. (637), 968; (2), 1047
Hodgson, A. E. (11,717), 968
Holland, T. J., and Laurie, A. P. (5,200), 968
Honbois, J. (10,476), 928

IRELAND, A. G., and Little, C. W. G. (1,156), 1048

JAMES, H. V. (571), 1008
Jelfs, G. H. (14,789), 968
John, P. (1,493), 1048
Johnson, E. H. (8,498. 3. Rennerfelt, United States), 928
Johnston, W. A., and Smith, J. N. (12,164), 892
Jones, P. L. (1,188), 1048
Justice, P. M. (6,125. The Pope Manufacturing Co. (Incorporated), United States), 928; (6,125A), 928; (13,804. The Emerson Electric Manufacturing Co., United States), 968

KERN, F., and Molitar, M. (16,350), 968
Krull, J. H. F. (13,328), 968

LAURIE, A. P., and Holland, T. J. (5,200), 968
Lee, C. E. (13,732), 892
Leffer, L. G. (11,349), 928
Lesthevenon, J. (16,627), 1008
Little, C. W. G., and Ireland, A. G. (1,156), 1048
Lorrain, J. G. (216. T. C. Esmond, United States), 1048
Lundell, R. (8,325), 928

McINNERNEY, B. (13,570), 928
Mackle, W. S. (14,593), 968
Macmillan, A. B. (12,706), 928
Molitar, M., and Kern, F. (16,350), 968
Monnard, H. (153), 1047
Muirhead, A. (516), 1008

NAYLOR, W. S., and Elieson, C. P. (1,230), 1048
Neill, S. D. (1,438), 1048

OSTMANN, C. (9,349), 968
Otis Elevator Co. (12,297. Otis Bros. and Co. Incor., United States), 928
Ottesen, H. R., and Bruns, L. J. (15,203), 968

PAUL, R. W. (485), 1008
Phillips, C. H. J., and Terry, E. F. (974), 1048
Pryce, H. J., and Ferriera, L. de M. G. (214), 1047

REED, G. J., Freed, F., Freed, I., Clink, D. K. (513), 928
Reitz, H. M. F., and Stendebach, C. F. P., (8,963), 968

SCHINDLER, F. W. (1087) 1048
Schmidt, M. (2,218) 968
Short, S. H. (16,366), 1008
Siemens Bros. & Co. (15,148. Siemens and Halske, Aktien-Gesellschaft, Germany), 928; (13,980), 968; (13,981), 968; (15,147), 968
Sloan, R. A., and Barnes, J. E. L. (1,044), 1048
Smith, J. N., and Johnston, W. A. (12,164), 892
Spagnoletti, J. E., and Crookes, J (9,672), 968
Stendebach, C. F. P., and Reitz H. M. F. (8,963), 968
Sutcliffe, G. W. (1,047), 1048
Swan, E. (16,005), 1008

TAYLOR, T. (12,183), 892
Terry, E. F., and Phillips, C. H. J. (974) 1048
Thomas-Davies, G. (200), 1047
Thompson, W. P. (3,311. C. J. Toerring United States), 892; (1,697. J. S. Thompson), 1048
Tobiansky, L. (13,896), 968

WAGNER, H. A. (1,141), 1048
Walker, H. J. (11,885), 968
Weidlich, M. (14,401), 968
Williamson, jun., J. D. (13,614), 968
Witter, J. (14,216. The Elektricitäts Aktien - Gesellschaft vormals Schuckert & Co., Germany), 928
Wulff, H. P. J., and Blunck, J. H. (14,877), 968

YARNOLD, R. J. (2,629), 928